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ENFOQUE Y ALCANCE

Arquitecturas del Sur es una de las revistas del Departamento de Diseño y Teoría de la Arquitectura, de la Facultad de Arquitectura, Construcción y Diseño de la Universidad del Bío-Bío (E-ISSN 0719-6466 ; ISSN 0716-2677), es editada semestralmente en los meses de enero y julio de cada año. Su publicación es seriada, de acceso abierto, arbitrada mediante revisión por pares (doble ciego) y, desde su primer número aparecido en 1983, su contenido atiende resultados de investigación originales e inéditos que amplían y fortalecen el conocimiento de la arquitectura latinoamericana y sus disciplinas afines.

Según el tesauro de la UNESCO, sus temáticas se inscriben en las líneas de arquitectura, del diseño, de los monumentos, de la preservación del patrimonio y de la planificación urbana. *Arquitecturas del Sur* admite la postulación de artículos científicos, resultados inéditos de investigación, tesis de Magíster y/o Doctorado y comunicaciones de congresos. También recibe revisiones temáticas actuales que aporten conocimiento nuevo sobre criterios en construcción, siempre que se encuentren dentro del enfoque general de la revista; esporádicamente publica números monográficos como resultado de convocatorias específicas y que, en esos casos, serán anunciadas a través de su plataforma en línea. El envío de manuscritos presupone, por parte de los autores, el conocimiento y cumplimiento de estas condiciones, así como del resto de las normas descritas en su Política Editorial. Los textos postulados deben estar desarrollados en español, inglés y/o portugués, ser originales e inéditos y no estar postulados simultáneamente en ningún otro tipo de publicación u órganos editoriales.

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EDITORIAL

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Los cambios y el paradigma

El año 2025 abre el debate público poniendo al mundo patas arriba. Lo estable se ha vuelto inestable. Se entra en caminos farragosos; las brújulas, nerviosamente enloquecidas, buscan dónde fijar un norte al que aferrarse. La verdad tornó en falso, y la falsedad en verdadero. Importantes gobiernos y mercados han instalado el desparpajo y hasta el miedo. Del mismo modo, en este tiempo, las guerras del otro lado del mundo, una vez más, quedan sin acabar y prolongan sus espasmos hasta hacerlos costumbre, espectáculo. Latinoamérica, por su parte, circula por sendas individuales, sin proyecto colectivo.

La experiencia de la modernidad, esa vorágine tan bien comprendida por Marshall Berman, no duda en imponer por ahora una de sus más altas contradicciones, en su trasiego por cambiarlo todo. Todo lo mata para fagocitarlo y hacerlo renacer con la idea que ahora -sí que sí- será mejor; y asumimos domesticadamente esa idea. El atractivo de la modernidad sigue siendo una idea seductora que aparenta insuflar vida.

En esta tolvanera, y a contracorriente, en nuestro ámbito editorial viene a la mente la quietud, el sosiego del espacio, la serenidad de lo sencillo. En esta ocasión presentamos primero dos artículos pendientes de la puesta en valor de espacios arquitectónicos y sus alternativas para los espacios de enseñanza. En este ámbito, los espacios educativos han sido tradicionalmente lugares que, amparados por las políticas públicas, tanto en sus planes de reforma como en la construcción de sus recintos, lleva ya más de un siglo dando diversas respuestas en los estados democráticos. Inspirados en la educación de sus sociedades en beneficio del progreso de las naciones han inspirado respuestas que han llegado a ser paradigmas de la arquitectura contemporánea. El texto *Adaptar los edificios escolares existentes a las nuevas pedagogías* de Alfredo Peláez, Maximiliano García y Fabricio González, que atiende un entorno americano, viene precisamente, a explorar las alternativas de la adaptación de estos locales a las nuevas demandas y relaciones entre las comunidades educativas. Su enfoque se centra en la manipulación de los límites espaciales, la adaptación sustentada en la incorporación intestina en el espacio educativo de objetos mayores, los macro-objetos- y su capacidad de transformarse en habitáculo que tensiona su entorno inmediato, y la reprogramación educativa que impone sobre sus arreglos mobiliarios. Los resultados, entre otros, avanzan sobre, más que crecimientos o ampliaciones, en la revisión del uso formativo contemporáneo del espacio escolar.

Del mismo modo, otro artículo complementa nuestro incesante aprendizaje desde la didáctica proyectual como modo de análisis y proyecto. La pedagogía de la arquitectura y el urbanismo tiene en el artículo *Diseño universal y metodologías activas: una práctica en los estudios de posgrado*, de las autoras Sabine De Paris y Vanessa Goulart un estudio asentado en el programa de Posgrado en Arquitectura, Urbanismo y Paisajismo (PPGAUP) de la Universidad Federal de Santa María (UFSM). La investigación examina

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metodologías activas para fomentar la participación dinámica en el proceso del aprendizaje. El texto muestra los ejercicios finales desarrollados en tres etapas. El resultado muestra el mobiliario, gamificación, mapas táctiles y señalización, útiles a la diversificación en la accesibilidad en el entorno académico.

Un segundo grupo lo constituyen textos dedicados al análisis patrimonial. En este caso, cuando la estructura de una obra cuando está dañada, suele ser un tema complejo en manos de arquitectos; si a ello le suma que la obra es una iglesia neogótica, el asunto es serio. El caso de estudio es la iglesia Santa Filomena (1892-1894), del reconocido arquitecto Eugenio Joanon Croizer, en la ciudad de Santiago, dañada por el llamado Terremoto de Talca de 1928. En este caso el dilema de su estabilización estructural es explicado con exquisita claridad. El artículo *Refuerzo con hormigón armado a principios del siglo XX en un templo neogótico de albañilería simple bajo un contexto sísmico*, de Santiago Sáenz Muñoz y Gabriela Muñoz, es uno de esos textos que afrontan académicamente las alternativas de un problema tan severo, pero cuyas explicaciones llanas hacen de lo difícil lo asequible. La comprensión de la obra y su oportuna restauración se torna total, hasta que, finalmente, la arquitectura, en sus formas, representaciones y sus estructuras se vuelve unitaria, total.

En el tema de la restauración, los factores convocados para la rehabilitación son múltiples. Así lo confirman Luciana da Silva Florenzano y Rosina Trevisan Martins Ribeiro en el artículo *¿Qué criterios cromáticos se pueden utilizar para la restauración arquitectónica?* El texto atiende los problemas del color y, consecuentemente, los asuntos de la percepción y la memoria con la realidad cromática de establecidos en tres centros urbanos de Brasil. Los resultados exponen el debate sobre la producción arquitectónica y la teoría en relaciones de coherencia para el patrimonio cultural y sus derivaciones identitarias.

En un sentido similar, el texto *Documentando la arquitectura republicana de Arequipa. Valoración espacial, constructiva y estilística de tres casonas emblemáticas*, de los autores Daniel Málaga, Fernando Cuzziramos, Tatiana Medina, Sergio Coll, y Denis Mayta indaga con precisión con nuevas tecnologías en construcciones republicanas patrimoniales de Arequipa, Perú. Se trata de casonas neoclásicas cuyas alternativas constructivas ponen en valor tradiciones constructivas como las estructuras se sillería de ignimbrita, bóvedas de cañón, etc. Las acciones validaron las estructuras espaciales originales.

Las investigaciones sobre el tema de la tipología son inagotables. Desde las consideraciones hechas por Giulio Carlo Argan y Rafael Moneo (*CA* n° 35 de 1983,), por nombrar un par de teóricos destacados, es evidente que su análisis sigue vigente. Marcelo Vizcaíno presenta en el artículo *Salas teatrales centenarias en San Juan, Argentina: entre la tipología lírica y los espacios alternativos* el caso de dos salas de teatro, uno el Coliseo y otro, el Teatro del Bicentenario, son comparados y valorados, en sus similitudes y diferencias, como parte del patrimonio local.

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Concentrado también en la función teatral Edison Gastón Segura-Arias, nos muestra en *Yuxtaposiciones intrínsecas en la fachada del Teatro Alhambra, Taltal, Chile* el estudio particular de la fachada del edificio. Una acuciosa investigación examina sus órdenes intrínsecos y su coherencia volumétrica, la distribución y las complejidades del programa que mezcla con una función comercial y otra residencial. Estas cuestiones revelan contenidos y geometrías estructurales que ponen en valor una obra singular del patrimonio norteño.

También en el norte de Chile, el caso de los Servicios Públicos de Antofagasta analizado por Damir Galaz-Mandakovic Fernández en *Modernización y racionalismo de la arquitectura institucional. El caso del edificio de los Servicios Públicos e Intendencia de Antofagasta (1889-1963)* expone el tránsito desde una arquitectura ecléctica hacia un lenguaje moderno. La intervención de Edwin Weil, arquitecto de la Dirección de Arquitectura en los años 50 y 60 en Chile, ofrece un caso de excepcional madurez contemporánea capaz de reflejar cómo las políticas institucionales adoptan el ideario de la arquitectura moderna con total solidez para la arquitectura estatal con implicancias en la imagen urbana.

Finalmente, la arquitectura en tierra comparece en este número como una materia recurrente en el contexto latinoamericano. El artículo *Evaluación de la sostenibilidad en arquitectura y construcción con tierra, en Santa Catarina, Región Sur de Brasil* de Cecília Heidrich Prompt, Julio Cesar Lopes Borges y Lisiane Ilha Librelotto examinan seis edificios emplazados en comunidades agrícolas de Santa Catarina, Región Sur de Brasil. La metodología, con base en Proyecto VerSus, es especifica y pertinente, ha sido adaptada al contexto brasileño y su normativa correspondiente; los resultados han puesto especial atención al ámbito socioeconómico.

Arquitecturas del Sur, expone en este número el interés disciplinar por el debate patrimonial-identitario y también los modos de operación pedagógicos que permiten afirmar que, el debate, el examen y la crítica, son componentes del constante avance académico. Los cambios son connaturales a toda evolución; el paradigma que nos impone la disciplina nos asiste.

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EDITORIAL

The changes and the paradigm

2025 opens the public debate, turning the world upside down. The stable has become unstable. One is entering murky waters. The compasses, nervously maddened, look for where to fix a north to which to cling. The truth became false, and falsehood became true. Important governments and markets have installed boldness and even fear. In the same way, at this time, wars on the other side of the world, once more, remain unfinished and prolong their spasms until they become a habit, a spectacle. Latin America, on the other hand, circulates along individual paths, without a collective project.

The experience of modernity, that maelstrom so well understood by Marshall Berman, does not hesitate to impose, for the time being, one of its greatest contradictions, in its quest to change everything. It kills everything to phagocytose it and make it reborn with the idea that now, for real, it will be better, and we assume that idea domestically. The appeal of modernity remains a seductive idea that seems to breathe life into it.

In this dust devil, and against the current, in our editorial field, the stillness, the tranquility of space, and the serenity of the simple come to mind. On this occasion, we first present two pending articles on enhancing architectural spaces and their alternatives for teaching spaces. In this field, educational spaces have traditionally been protected by public policies, both in their reform plans and the construction of their campuses, which have given various responses in democratic states for more than a century. Inspired by their societies' education for the benefit of nations' progress, they have inspired responses that have become paradigms of contemporary architecture. The text, *Adapting existing school buildings to new pedagogy approaches* by Alfredo Peláez, Maximiliano García, and Fabricio González, which considers an American environment, comes precisely to explore the alternatives of adapting these premises to the new demands and relations between educational communities. Its approach focuses on the manipulation of spatial limits, the adaptation based on the intestinal incorporation into the academic space of larger objects, macro-objects, and their ability to transform into a living space that stresses their immediate environment, and the educational reprogramming that imposes on their furniture arrangements. The results, among others, advance beyond growth or expansions in reviewing the contemporary formative use of school space.

In the same way, another article complements our incessant learning from the projectual didactics as a mode of analysis and project. The pedagogy of architecture and urbanism has, in the article *Universal design and active methodologies: a practice in postgraduate studies*, by the authors Sabine De Paris and Vanessa Goulart, a study based on the Postgraduate program in Architecture, Urbanism and Landscaping (PPGAUP) of the Federal University of Santa Maria (UFSM). The research examines active methodologies to encourage dynamic participation in the learning process. The text shows the final exercises developed in three stages. The result shows furniture, gamification, tactile maps, and signage, which are useful for diversifying accessibility in the academic environment.

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A second group consists of texts dedicated to heritage analysis. In this case, when the structure of a work is damaged, it is usually a complex issue in the hands of architects; if you add that the work is a neo-Gothic church, the matter is serious. The case study is the Santa Filomena church (1892-1894), designed by the renowned architect Eugenio Joanon Croizer in the city of Santiago, which the 1928 Talca Earthquake damaged. In this case, the dilemma of its structural stabilization is explained with exquisite clarity. The article, *"Reinforcement using reinforced concrete at the beginning of the 20th century in a simple masonry neo-Gothic temple within a seismic context"* by Santiago Sáenz Muñoz and Gabriela Muñoz, is one of those texts that academically confront the alternatives to such a severe problem, but whose simple explanations make the difficult, feasible. The understanding of the work and its timely restoration becomes total until the architecture, in its forms, representations, and structures, becomes unitary and total.

Multiple factors call for rehabilitation on the subject of restoration. Luciana da Silva Florenzano and Rosina Trevisan Martins Ribeiro confirm this in the article *"What color considerations could be used for architectural restoration?"* The text addresses the problems of color and, consequently, the issues of perception and memory with the chromatic reality of three urban centers in Brazil. The results present the debate on architectural production and theory in coherence relations for cultural heritage and its identity derivations.

In a similar sense, the text *Documenting Republican Architecture in Arequipa. Spatial, Constructive, and Stylistic Assessment of three Emblematic Casonas*, by Daniel Málaga, Fernando Cuzziramos, Tatiana Medina, Sergio Coll, and Denis Mayta, investigates the use of new technologies closely in Republican patrimonial constructions of Arequipa, Peru. These are neoclassical mansions whose construction alternatives highlight construction traditions such as ignimbrite masonry structures, barrel vaults, etc. The actions validated the original spatial structures.

Research on the topic of typology is inexhaustible. From the considerations made by Giulio Carlo Argan and Rafael Moneo (*CA* No. 35 of 1983), to name a couple of outstanding theorists, it is evident that their analysis is still valid. Marcelo Vizcaíno presents in the article *Centennial theater buildings in San Juan, Argentina: Between lyrical typology and alternative spaces,* the case of two theater halls, the Coliseo and the Bicentennial Theater, which are compared and valued, in their similarities and differences, as part of the local heritage.

Also focused on the theatrical performance, Edison Gastón Segura-Arias shows us in *Intrinsic juxtapositions of the facade of the Alhambra Theater, Taltal, Chil*e, the particular study of building facades. A thorough investigation examines its intrinsic orders and volumetric coherence, the distribution, and the complexities of the program, which mixes a commercial and a residential role. These questions reveal contents and structural geometries that highlight a unique work of northern heritage.

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Also in the north of Chile, the Public Services of Antofagasta case, analyzed by Damir Galaz-Mandakovic Fernández in *Modernization and rationalism in institutional architecture. The case of Public Services and the Antofagasta Regional Government Building (1889-1963),* presents the transition from an eclectic architecture to a modern language. The intervention of Edwin Weil, architect of the Architecture Department in the 1950s and 1960s in Chile, offers a case of exceptional contemporary maturity capable of reflecting how institutional policies adopt the ideology of modern architecture with total solidity for state architecture, which has implications for the urban image.

Finally, architecture on land appears in this issue as a recurring subject in the Latin American context. The article *"Assessment of Sustainability in Earth-Based Construction and Architecture"*, in Santa Catarina, Southern Region of Brazil, by Cecília Heidrich Prompt, Julio Cesar Lopes Borges, and Lisiane Ilha Librelotto, examines six buildings located in agricultural communities in Santa Catarina, in the Southern Region of Brazil. The methodology, based on the VerSus Project, is specific and relevant. It has been adapted to the Brazilian context and its corresponding regulations, and the results have paid special attention to the socio-economic field.

Arquitecturas del Sur presents, in this issue, the disciplinary interest in the heritage-identitarian debate and the pedagogical modes of operation that allow us to affirm that debate, examination, and criticism are components of constant academic progress. Changes are inherent to all evolution; the paradigm imposed by discipline assists us.

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EDITORIAL

As mudanças e o paradigma

O ano de 2025 inaugura o debate público colocando o mundo de ponta-cabeça. O estável tornou-se instável. Adentra-se por caminhos tortuosos; as bússolas, nervosamente descontroladas, buscam onde fixar um norte para se aferrar. A verdade tornou-se falsidade e a falsidade, verdade. Governos e mercados importantes instalaram o despeito e até o medo. Do mesmo modo, neste tempo, as guerras do outro lado do mundo, mais uma vez, permanecem sem fim e prolongam seus espasmos até fazer deles um costume, um espetáculo. A América Latina, por sua vez, transita por caminhos individuais, sem um projeto coletivo.

*A experiência da modernidad*e, esse turbilhão tão bem compreendido por Marshall Berman, não hesita e nos impõe, por ora, uma de suas maiores contradições, em sua ânsia por mudar tudo. Ela mata tudo para fagocitar e fazer que tudo renasça com a ideia de que agora – desta vez sim – será melhor; ideia esta que assumimos docilmente. O fascínio pela modernidade ainda é sedutor e parece insuflar vida.

Em meio a essa ventania, e na contramão, em nosso espaço editorial o que vem à mente é a quietude, a calma do espaço, a serenidade do simples. Nesta ocasião, apresentamos primeiramente dois artigos voltados à melhoria dos espaços arquitetônicos e suas alternativas para espaços educacionais. Nesse campo, os espaços educacionais são tradicionalmente lugares que, amparados por políticas públicas, tanto em seus planos de reforma quanto na construção de seus recintos, vêm dando respostas diversas nos Estados democráticos há mais de um século. Inspirados pela educação de suas sociedades em benefício do progresso das nações, eles inspiraram respostas que se tornaram paradigmas da arquitetura contemporânea. O texto *Adaptação dos edifícios escolares existentes às novas pedagogias*, de Alfredo Peláez, Maximiliano García e Fabricio González, que trata de um cenário americano, vem justamente para explorar as alternativas de adaptação dessas instalações às novas demandas e relações entre as comunidades educacionais. Sua abordagem se concentra na manipulação dos limites espaciais, na adaptação sustentada pela incorporação interna ao espaço educacional de objetos maiores – macro-objetos –, em sua capacidade de se transformar em um habitáculo que tensiona seu entorno imediato e na reprogramação educacional que essa incorporação impõe em seus arranjos de mobiliário. Os resultados, entre outros, avançam na revisão do uso formativo contemporâneo do espaço escolar e não em seu crescimento ou ampliação.

Da mesma maneira, outro artigo complementa nosso incessante aprendizado a partir da didática projetual como método de análise e projeto. Em *Desenho universal e metodologias ativas: uma prática na pós-graduação*, as autoras Sabine De Paris e Vanessa Goulart apresentam um estudo realizado no Programa de Pós-graduação em Arquitetura, Urbanismo e Paisagismo (PPGAUP) da Universidade Federal de Santa Maria (UFSM). A pesquisa investiga metodologias ativas que incentivam uma participação dinâmica no

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processo de aprendizagem. O texto ilustra os exercícios finais desenvolvidos em três etapas, resultando em mobiliários, gamificação, mapas táteis e sinalização úteis para diversificar a acessibilidade no ambiente acadêmico.

Um segundo grupo de textos dedica-se à análise patrimonial. Neste campo, quando a estrutura de uma obra está danificada, costuma ser uma questão complexa nas mãos de arquitetos; se acrescentarmos o fato de que a obra é uma igreja neogótica, o assunto torna-se sério. O estudo de caso é a Igreja Santa Filomena (1892-1894), do renomado arquiteto Eugenio Joanon Croizer, na cidade de Santiago, danificada pelo chamado Terremoto de Talca de 1928. Neste caso, o dilema da estabilização estrutural é explicado com impecável clareza. *O artigo Reforço com concreto armado no início do século XX em um templo neogótico de alvenaria simples em um contexto sísmico*, de Santiago Sáenz Muñoz e Gabriela Muñoz, é um daqueles textos que aborda academicamente as alternativas para um problema muito sério, mas com explicações simples que convertem o que é difícil em algo acessível. A compreensão da obra e sua restauração oportuna torna-se completa, até que finalmente a arquitetura, em suas formas, representações e estruturas, torna-se unitária, total.

Em se tratando de restauração, há muitos fatores diferentes envolvidos na restauração. É o que confirmam Luciana da Silva Florenzano e Rosina Trevisan Martins Ribeiro no artigo *Que critérios cromáticos utilizar para a restauração arquitetônica?*. O texto aborda a problemática da cor e, consequentemente, as questões de percepção e memória com a realidade cromática de edifícios consagrados em três centros urbanos do Brasil. Os resultados expõem o debate sobre a produção e a teoria arquitetônica nas relações de coerência para o patrimônio cultural e suas derivações identitárias.

Em uma linha semelhante, o texto *Documentando a arquitetura republicana em Arequipa. Avaliação espacial, construtiva e estilística de três casonas emblemáticas*, dos autores Daniel Málaga, Fernando Cuzziramos, Tatiana Medina, Sergio Coll e Denis Mayta, investiga com precisão, usando novas tecnologias, edifícios do patrimônio republicano em Arequipa, Peru. Trata-se de mansões neoclássicas cujas alternativas construtivas valorizam tradições construtivas, como estruturas de alvenaria de ignimbrite, abóbadas de berço etc. As ações validaram as estruturas espaciais originais.

As pesquisas sobre tipologia são inesgotáveis. Desde as considerações de Giulio Carlo Argan até Rafael Moneo (CA n° 35 de 1983), para citar dois renomados teóricos, seu estudo permanece relevante. Marcelo Vizcaíno, no artigo *Edifícios de teatros centenários em San Juan, Argentina: entre tipologia lírica e espaços alternativos*, compara e valoriza duas salas de teatro locais – o Coliseo e o Teatro del Bicentenario – em suas semelhanças e diferenças, como parte do patrimônio.

Também focado na função teatral, Edison Gastón Segura-Arias nos mostra em *Justaposições intrínsecas na fachada do Teatro Alhambra de Taltal, Chile,* um estudo particular da fachada do edifício. Uma investigação meticulosa

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examina suas ordens intrínsecas e coerência volumétrica, a distribuição e as complexidades do programa que mescla uma função comercial e uma residencial. Estas questões revelam conteúdos e geometrias estruturais que aumentam o valor de uma obra singular do patrimônio do norte do Chile.

Também no norte do Chile, o caso dos Serviços Públicos de Antofagasta foi analisado por Damir Galaz-Mandakovic Fernández em *Modernização e racionalismo na arquitetura institucional. O caso do edifício dos Serviços Públicos e da Intendência de Antofagasta (1889-1963)* expõe a transição de uma arquitetura eclética para uma linguagem moderna. A intervenção de Edwin Weil, arquiteto da Diretoria de Arquitetura nas décadas de 1950 e 1960 no Chile, oferece um caso de excepcional maturidade contemporânea capaz de refletir como as políticas institucionais adotam o ideário da arquitetura moderna com total solidez para a arquitetura estatal, com implicações para a imagem urbana.

Por fim, a arquitetura em terra aparece nesta edição como um tópico recorrente no contexto latino-americano. O artigo *Avaliação da sustentabilidade em arquitetura e construção com terra*, de Cecília Heidrich Prompt, Julio Cesar Lopes Borges e Lisiane Ilha Librelotto, examina seis edificações localizadas em comunidades agrícolas de Santa Catarina, Região Sul do Brasil. A metodologia, baseada no Projeto VerSus, é específica e relevante, e foi adaptada ao contexto brasileiro e suas regulamentações correspondentes; os resultados deram especial atenção ao âmbito socioeconômico.

Arquitecturas del Sur apresenta nesta edição o interesse disciplinar pelo debate patrimonial-identitário e também os modos de operação pedagógica que nos permitem afirmar que o debate, o exame e a crítica são componentes do progresso acadêmico constante. As mudanças são conaturais a toda evolução; o paradigma que nos é imposto pela disciplina nos auxilia.

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Editorial

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ADAPTING EXISTING SCHOOL BUILDINGS TO NEW PEDAGOGICAL APPROACHES

ADAPTAR LOS EDIFICIOS ESCOLARES EXISTENTES A LAS NUEVAS PEDAGOGÍAS

ADAPTAÇÃO DOS EDIFÍCIOS ESCOLARES EXISTENTES ÀS NOVAS PEDAGOGIAS

Figura 0. Dorte Mandrup Architects, reforma de escuela Munkegaards en Copenhague, Dinamarca, de 2007. Fotografías del interior del aula. Fuente: Elaboración de los autores.

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RESUMEN

Los cambios en los modos de enseñanza que se están debatiendo actualmente, tanto en Uruguay, América Latina, Europa o Estados Unidos, demandan un nuevo paradigma espacial, diferenciado respecto a la concepción tradicional de la escuela. Frente a este panorama parece necesario ofrecer nuevos modelos de intervención en los edificios existentes que respeten las restricciones económicas y de sostenibilidad, que además den respuesta a los cambios de esa nueva agenda pedagógica, que faciliten y promuevan la implementación de esas innovaciones educativas que muchas veces, se pueden ver limitadas por los escenarios escolares. Este artículo pretende identificar y analizar modos de intervención en edificios escolares existentes a partir de la manipulación del espacio interior como estrategia, en el que interactúa el diseño y la arquitectura. El énfasis se coloca en la sistematización de las estrategias de proyecto arquitectónico, como herramientas necesarias para la intervención del arquitecto en sus interacciones con las comunidades educativas y equipos de proyecto en cada caso. Se han identificado tres aproximaciones básicas: manipulación de los límites; inserción de macro-objeto (s) y la reprogramación basada en la forma y arreglo del mobiliario.

Palabras clave: diseño arquitectónico, interiorismo, mobiliario, montaje, refuncionalización

ABSTRACT

The changes in teaching methods currently being discussed, whether in Uruguay, Latin America, Europe, or the United States, demand a new spatial paradigm different from the traditional conception of a school. Faced with this scenario, it seems necessary to offer intervention models for existing buildings that respect economic and sustainability restrictions and respond to the changes of this new pedagogical agenda, facilitating and promoting the implementation of these educational innovations that school scenarios can often limit. This article aims to identify and analyze modes of intervention in existing school buildings based on manipulating the interior space as a strategy where design and architecture interact. In each case, the emphasis is placed on the systematization of architectural project strategies as tools needed for the architect's intervention in their interactions with the educational communities and project teams. Three basic approaches have been identified: manipulation of boundaries, insertion of macro-object(s), and reorganization based on the shape and arrangement of furniture.

Keywords: architectural design, interior design, furniture, assembly, refunctionalization.

RESUMO

As mudanças nos métodos de ensino que estão sendo debatidas atualmente no Uruguai, na América Latina, na Europa e nos Estados Unidos exigem um novo paradigma espacial, diferente da concepção tradicional da escola. Diante desse panorama, parece necessário oferecer novos modelos de intervenção em edifícios existentes que respeitem as restrições econômicas e de sustentabilidade, que também respondam às mudanças dessa nova agenda pedagógica, que facilitem e promovam a implementação dessas inovações educacionais que muitas vezes podem ser limitadas pelos cenários escolares. Este artigo tem como objetivo identificar e analisar modos de intervenção em edifícios escolares existentes a partir da manipulação do espaço interior como estratégia de interação entre design e arquitetura. A ênfase é colocada na sistematização das estratégias de projeto arquitetônico como ferramentas necessárias para a intervenção do arquiteto em suas interações com as comunidades educacionais e as equipes de projeto em cada caso. Foram identificadas três abordagens básicas: manipulação de limites; inserção de macro-objeto(s) e reprogramação com base na forma e na disposição do mobiliário.

Palavras-chave: projeto arquitetônico, design de interiores, mobiliário, montagem, refuncionalização

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INTRODUCTION

The changes in teaching methods currently under debate in Uruguay, Latin America, Europe, and the United States seem to demand a spatial paradigm for a school's layout and furniture that differentiates from the school's traditional conception (Partnership for Schools, 2008), where a class is taught from the board. In this sense, experiences have been implemented in the last 20 years in diverse fields (academia, foundations, public programs), mainly European and North American ones, that challenge conventional ways of organizing the school building, radically changing its system of relationships and with this, its spatial structure (Nedel & Buzzar, 2020). The aim is to focus on student-centered education with varied and fluid classrooms. These proposals are usually based on a project of buildings with a new floorplan, where it is possible to fully express current pedagogical demands, with old buildings either replaced or extensively modified. At the same time, the criteria to meet these demands and make these transformations are diverse, with a multiplicity of relevant actors and divergent proposals that, at times, can be contradictory.

In the context of the Southern Cone, in particular, Uruguay, with a very extensive and high-quality building stock, mostly built at the start of the 20th century under the criteria of a teacher-centered pedagogy (Barrán Casas, 2020), these types of replacement strategies or high-impact interventions do not seem to be a viable alternative from an economic or sustainable point of view. The demolition or large-scale transformation of these buildings would require efforts and investments that are probably unavailable in the context of scarcity. At the same time, some socially and culturally valued constructions would be lost. Demolition also implies substantial waste and the loss of existing, installed, and consolidated infrastructure, making these operations unsustainable (Cabrera Recoba, 2021; Lacaton, Vassal, & Walker, 2022). Although there is abundant literature on the reuse of buildings of different types (Lanz & Pendlebury, 2022), considering the renovation of existing school layouts from the point of view of their interior space is lacking.

Given this scenario, it seems necessary to offer new intervention models for existing buildings that respect economic and sustainable restrictions and can respond to changes in the new pedagogical agenda, where educational innovations, which sometimes may be limited by school layouts, are facilitated and promoted. This article aims to identify and analyze three modes of intervention: the manipulation of boundaries, the insertion of macro-object(s), and reorganization based on the furniture's shape and arrangement, under the argument that it is possible to adapt these buildings by adjusting the interior space, where design and architecture interact.

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THEORETICAL FRAMEWORK

Architecture and design objects, particularly furniture, are part of the school's material culture. They collaborate in a relevant way in structuring the school space and the social relations there (Kozlovsky, 2016). They can be understood as interfaces (Bonsiepe, 2005) between activities, people, and their environment in a given socio-cultural context, mainly through their relational nature. In this way, the organization of space at building and furniture levels should be aligned to include the virtues of the teaching activities.

Operating from the interior space through actions that combine architecture and furniture would allow a project development under the aforementioned restrictions, offering new meanings to the architecture and its spaces by redefining its system of relationships (Giardiello, 2019). This implies a reading of pre-existence, its organization, and materiality, among other qualities, an interpretation that identifies the elements that can be preserved and those that can be modified (Postiglione, 2018; Giardiello, 2017), putting into play the relational value of architecture and objects. This approach is not always considered, and operations that renounce interior modification are more commonplace, opting to include an extension or restore the buildings, maintaining their original layout (Mirchandani & Wright, 2019; Heitor, 2011). Thus, emphasis is placed on systematizing architectural project strategies as tools for the architect's intervention in their interactions with educational communities and project teams.

METHODOLOGY

For this study, 18 interventions in school buildings at an international level were reviewed. These interventions adapt the preexisting, teacher-centered interior space to the needs of current, student-focused pedagogies. These interventions should comply with having project quality endorsed by critics and academia so that they are disseminated in specialized publications or that their authors stand out in the field. This review's observations allowed the identification of three recurring basic approaches: the manipulation of boundaries, the insertion of macro-object(s), and reorganization based on the furniture's shape and arrangement. These approaches characterize the interactions of furniture and architecture by acting directly on the space's organization, encouraging or not different appropriations, links, and uses depending on the new requirements. The analysis is based on a selection of four of the eighteen cases, representative of the approaches, which have enough information for their analysis and the study. To conduct the research, the cases analyzed with identical criteria were redrawn using the available documentation to facilitate their comparison and recognition.

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In this way, the debate on the new school scenarios in which architecture and pedagogy are related is presented first before addressing the modes of intervention and closing with a discussion of the contributions made.

DEVELOPMENT

New pedagogy, new school architecture

Most school buildings built in the first half of the 20th century in Latin America, Europe, and the United States follow a traditional conception of education. The classrooms, understood as one efficient and massive "***school machine***" (Pinau, Dussel, & Caruso, 2001), adopted proportions that facilitate the teacher-centered lesson, as an auditorium equipped with desks where students are expected to be quiet and still. The broad windows complement the room's height but do not allow going directly outside or contemplating it when sitting. The differentiation and segregation between the teaching area in the classroom and the rest of the spaces, designed for specific activities, such as people's movement in the corridors, is clear for the entire building.

There is currently awareness of the redefined role of knowledge in contemporary societies thanks to the emergence of information and communication technologies. However, the role of schools as places to acquire skills and knowledge for an increasingly uncertain future has been questioned (Hartley, 2003). In this context, there is a high dispersion of the proposals (Marina, 2017), but there is a relative consensus on focusing education on students and reformulating the thinking of the new school. An example is the dissemination of "***project-based learning***" (Scott, 2015), where the student's autonomy and creativity are hierarchized, often relying on technological tools (Ripani & Muñoz, 2020). An interdisciplinary and diverse approach to knowledge is recognized (Dussel, 2020), which dismisses pedagogical dogmatism for another that offers different ways of being and learning at school (Opertti, 2019). This outlook seems to question the previous scenarios and calls for differentiated solutions. The proposals for new school architecture revolve around bringing the educational community together, expanding the classroom towards the outside and other areas of the school, and deinstitutionalizing the school environment.

The approach of ecological and environmental development (Bronfenbrenner, 1987) is taken on by contemporary architects or public institutions dedicated to educational research (Eslava Cabanellas & Fernández Angosto, 2020; Lippman, 2023; Chipa & Orlandini, 2019). This perspective considers the different relationship scales, from the micro (classroom) to the macro (neighborhood-city), emphasizing an educational community's construction. To do this, generous spaces are projected for formal and informal

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meetings, understanding the school as a city, where the circulation areas are thought of as streets or squares and the classrooms are grouped as if they were a neighborhood (Mayoral-Campa & Pozo-Bernal, 2017), which emphasizes the intermediate areas of relationship. In this sense, the outdoor areas are privileged spaces for extending the classroom and the school, also acquiring a teaching role (Fontana & Mayorga Cárdenas, 2017).

This extension of the pedagogical area is assumed in other cases in a more literal way, where the experiences of the open space schools are reviewed, organizing the school scenario considering the furniture (Gislason, 2015), in large classroom spaces or common rooms. In these scenarios, students can find their preferred places and ways of interacting and learning or present a structured activity pattern (Nedel & Buzzar, 2020).

The consensus towards deinstitutionalization of the school scenario is evident (Preston, 2023), introducing environmental characteristics typical of other areas, such as the house or the cafeteria, that induce relationships of greater informality and comfort, with the hope that this will also produce greater commitment and enthusiasm in students and teachers (Lippman & Mathews, 2018), attempting to include them in the design processes. The relevance of the architecture and design of interior spaces (Acaso, 2018) is thus underlined, in clear contrast to the traditional building, in the creation of a stimulating atmosphere and the redefinition of the system of school relationships to review its limits, links, and the activities that they induce and suggest.

Intervention methods

Adaptation based on the manipulation of spatial boundaries

In school buildings designed for traditional pedagogy, the distribution of space based on a cellular layout of more private areas (classrooms) and other more public ones (corridors) gives the boundary a central role in the constitution of the school space. The boundary, built from various enclosures, gives shape to the space and contains it; it can communicate, differentiate, and segregate spatial cells. Thus, manipulating the boundaries, their geometry, and porosity would allow the reconfiguration of spatial and social relations within the school, expanding the pedagogical areas and the possibilities of using the different premises.

An example of this mode of operation is the case by architect Prakash Nair and architect Randall Fielding, who intervened in Forrest Avenue Elementary School in Middletown, Rhode Island, United States, in 2008 (Figure 1), where the central corridor was expanded to two naves with classrooms grouped in parallel lines (Nair, Fielding & Lackney, 2020). Light partitions were removed from some classrooms, and the corridor was extended to accommodate a new and spacious study and

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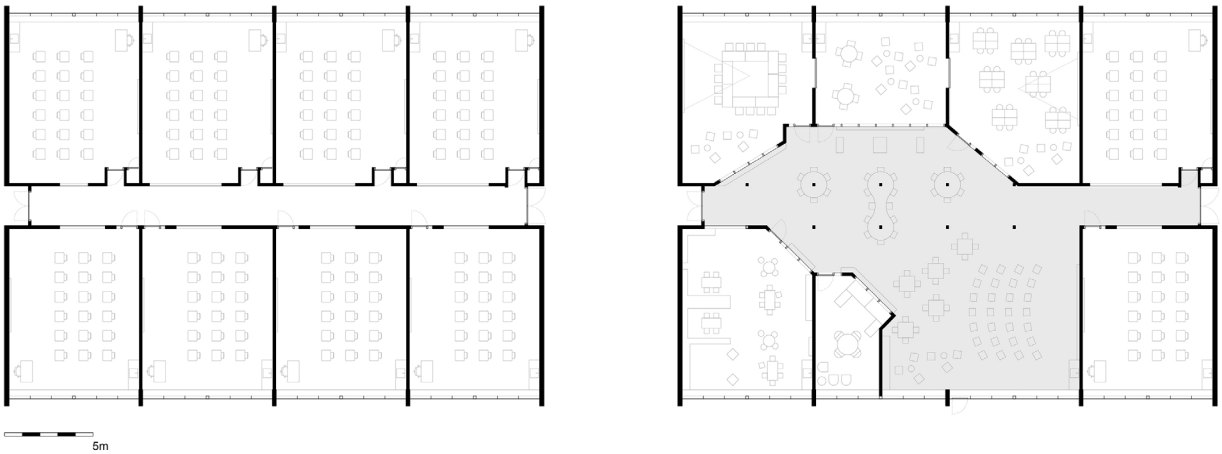

Figure 1. Prakash Nair and Randall Fielding. Forrest Avenue School sector in Middletown, Rhode Island, United States, 2008. Original floor plan (left) and reform (right). Source: Prepared by the authors based on Nair, Fielding, and Lackney (2020).

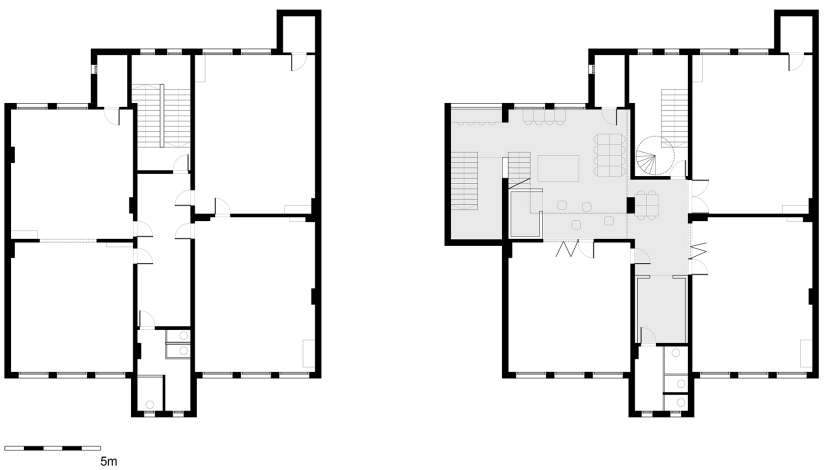

Figure 2. Reform of the architect Herman Hertzberger, Der Jordaan School in Amsterdam, the Netherlands, 2006. Original floor plan (left) and reform (right). Source: Prepared by the authors based on Hertzberger and de Swaan (2009).

informal meeting space at the heart of the floor plan, which was equipped with differentiated furniture. This new space breaks from the traditional classroom organization by emphasizing common areas as learning areas, complementary to the classroom system, and maintaining a variety of options in the building. In fact, the created space is perceived by contrast with the existing classrooms, feeding off each other.

On the other hand, the architect Herman Hertzberger, when adapting the old Der Jordaan school building in Amsterdam in the Netherlands (Hertzberger & de Swaan, 2009), a compact school with several floors and a central corridor, decided to transform one of the classrooms to expand the circulation space and generate a common space for meetings and informal activities (Figure 2). Unlike Prakash Nair and Randall Fielding, the doors of the remaining classrooms are widened, with transparent sections, to maximize the link with this new space, establishing continuities and common activities. It is an intervention where it is possible to imagine linking classrooms with each other, with or without mobile enclosures, for work in larger groups, or for students to wander according to their interests. In this case, the

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school's general layout is largely maintained; the elements that generate links are used in a limited way, where the door that unites them is the boundary between the classroom and the corridor.

Similarly, it is possible to work on the windows of the classrooms' external enclosures, removing their parapets and changing them for doors-windows (Nair, 2014). This would allow the classrooms to communicate directly with the external courtyards without crossing the rest of the building, encouraging outdoor pedagogical activities and the continuity of the interior with the exterior.

However, the boundary can be more than a line on a plane expressed on a wall; it can also have "thickness." In this way, the boundary can contain a space that links the areas it separates, understanding it as an ***intermediate*** one (Van Eyck, 2021). Thus, it is possible to modify the geometry of the wall between the classroom and corridor or classroom and playground to generate access or exit thresholds to include furniture and windows in the walls (Hertzberger & de Swaan, 2009; Lippman, 2010).

Thus, the removals and additions subtly work inside the architectural container, transforming the school space with few resources. This way, the available space is expanded without necessarily creating new square meters, which allows working on the possible relationships that this solution creates.

Adaptation based on the insertion of macro-object(s)

As its name suggests, a macro-object is a large design object that provokes and contains space, encouraging activities inside and outside, which dialogue with the mural container of the premises where it is placed. Its role is usually as a living space and articulator of a relatively isotropic and continuous space, contrasting the envelope that contains it. A macro-object can be seen as a graft on the pre-existing building, a radical intervention in its system of relationships, which brings new uses and meanings. A design object that plays with scale, halfway between architecture and design, as a small construction within a larger one. This type of operation takes up the experiments of the late 1960s and early 1970s of the designer Victor Papanek or the artist and designer Bruno Munari, among others, who explored the nomadic colonization of inhabited space, exercising a critique of contemporary developments in architecture (Eslava-Cabanellas, 2017), which this type of objects made possible from their deployment and possibility of displacement. (Flora & Iarruso, 2017; Giardiello, 2019).

In 2009, Dorte Mandrup used macro-objects to intervene in the Munkegaard School, built in 1957 by the architect and designer Arne Jacobsen (1902-1971) on the outskirts of Copenhagen, Denmark, to adapt the building to new uses without making significant modifications (Figure 3 and Figure 4), given its heritage protection as a canonical work of

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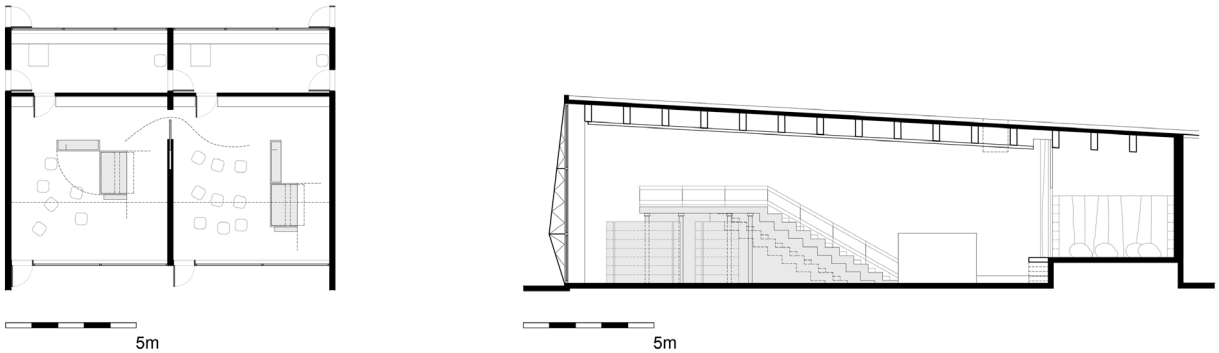

Figure 3. Dorte Mandrup Architects, Munkegaard School renovation in Copenhagen, Denmark, from 2009. Floor plan of a pair of classrooms and a section of the assembly hall with macro-object interventions. Source: Prepared by the authors based on GENTOFTE KOMMUNE (2013).

Figure 4. Dorte Mandrup Architects, renovation of Munkegaard School in Copenhagen, Denmark, from 2007. Photographs from inside the classroom and the assembly hall. Source: Prepared by the authors.

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modern school architecture (GENTOFTE KOMMUNE, 2013). Although the intervention stands out for a larger extension in the building's basement, the macro-objects inserted are of interest to this research. On the one hand, it transforms the assembly hall into a library, arranging a playful structure of mobile shelves in the center, with steps that allow you to climb to a mezzanine and watch a show or event on the hall's stage. In this way, an interior room (the library) and an exterior one (steps and mezzanine) are configured to radiate their particular activity, changing the meaning of the space without affecting its envelope.

On the other hand, some classrooms have folding furniture for the different activities they want (desk, screen, whiteboard, or screen) while collaborating in dynamically articulating the classroom space into areas with differentiated uses. The classroom is equipped in such a way that it ceases to be a single and homogeneous space and is articulated according to the pedagogical needs of each moment. Here, too, the object is central in contrast with the envelope, without materially affecting it, where the activities that give meaning to the space radiate, offering people opportunities to transform it.

From these examples, it is also possible to imagine the placement of macro-objects that delimit and communicate spaces and activities, which provide thickness and cavity to the walls, integrating two modes of action. Remarkably, the entire school space could be structured based on the arrangement of these large objects, articulators of continuous and fluid school space, as imagined by Cristiano Toraldo di Francia (2015) with the "***Parete Integrato System***" in 1973, perhaps achieving the dissolution of the classroom.

Adaptation based on the shape and arrangement of the furniture

School furniture can be associated as a means and expression of pedagogy to induce a specific type of social relationship and contain the body of people. The two-seater fixed bench of the traditional school has been put up against the Scholanovist collective table in the debate for transforming the school environment during the last century (Castro, 2007) based on the behaviors that make its specific form and arrangement possible. The occupation of space by these objects seems to be a tool for interpreting architecture and changing the interpersonal relationships that occur inside without affecting building elements. Thus, the architecture of the traditional school would remain as a background, relatively neutral, compared to the figure of the furniture.

There is evidence of a kind of flexibility in the use of school space independent of the transformation of the building or the incorporation of large objects based on people's actions when interpreting and appropriating the pre-existing layout (Till & Schneider, 2005). Given its relative degree of neutrality, its traditional division into cells is an advantage insofar as it would allow a re-reading through different kinds of furniture.

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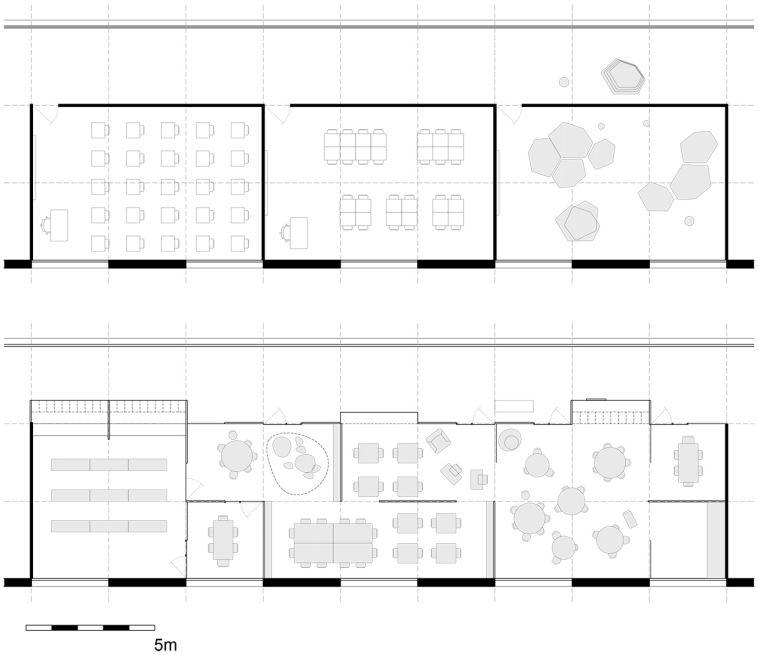

Figure 5. Clara Eslava and Miguel Tejada. Hextable from 2019 and proposal on a linear classroom layout with a corridor on the facade. Floor plan with traditional organization and Hextables (above). Floor plan with organization according to the furniture (below). Source: Prepared by the authors based on Eslava Cabanellas (2023).

The architects Clara Eslava and Miguel Tejada designed tables that promoted teamwork and a playful appropriation of space, which accompanied the process of creating a new school, the Arbizuko Herri Eskola in Navarra, Spain, which had a traditional structure (Eslava Cabanellas, 2023). Faced with the dissatisfaction that the educational community had with the school furniture available on the market and with the available classroom format, the architects designed irregular hexagonal wooden tables for the various ages of the students who would study in each classroom and the collaborative activities that the pedagogy adopted by the teachers provided (Figure 5). Students could share the same table and look at each other, restructuring the traditional directionality of the space towards the teacher while functioning as a playroom for the children placed under them.

This operation can be understood as an intervention that subverts the space's planned organization, proposing other modes of interpersonal relationship based on the furniture's shape and arrangement. Even the architects propose going further and abandoning the uniform organization of the classrooms for their differentiated occupation by the furniture, conceived by unstructured places of appropriation.

This contrasts with the contemporary prescriptions of complex classrooms, structured based on different seasons with well-defined activities and colorful furniture, exacerbating their iconic condition (Nedel & Buzzar, 2020). The experience of Eslava and Tejada appeals to people's autonomy, spontaneity, and imagination, making suggestions with the shape and materials of the designed objects.

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On the other hand, it is interesting to consider the classrooms differentiated from each other, filling them with diverse furniture. Students working on projects can choose the necessary study room throughout their development, advised by teachers. Thus, the space and time of use of the available educational architecture are transformed (Wells, 2016) by intentionally appropriating the existing distribution with the objects.

CONCLUSION

This research highlights that fully using and transforming the existing is understood as an ethical premise in the context of limited resources and the need for a more sustainable approach to building the physical environment, which positions interior architecture and its instruments at the forefront. Rather than extending the building's physical floor plans, it is proposed to adjust its layout, focusing on the adaptive use of the existing one, which seeks to contribute to the debate and practice of contemporary school architecture.

The methods presented should not be interpreted as watertight or exhaustive. These should be accompanied by studying surfaces, materials, colors, and lighting, which help shape the atmosphere of the rooms. These variables can highlight, by contrast, the intervention and the relationships sought, which manipulate the tactile and visual quality of objects and architecture.

The complementary condition of the modes analyzed has been observed from their scalar sequence, from the spatial container to the objects that colonize it, obtaining mixed approximations. Thus, where removing boundaries opens up the space, it can be articulated with macro-objects or colonized by furniture, depending on the activities sought. Similarly, including a macro-object may imply overcoming existing boundaries, inserting itself into a wall between the classroom and corridor, or organizing and defining the furniture that complements it.

Manipulating the boundaries within the school implies finding an existing space and establishing other relationships that use and rely on what has been built. It is about cutting, folding, opening, and maybe "gluing" the school's walls like a child's creation. In the same sense, the connection and colonization by design objects act from a spatial and temporal procedure of placing one project inside another. On the one hand, relationships are opened and established by removing and adding elements. On the other hand, are the objects that, in form, scale, and arrangement, induce behaviors and articulate spaces, interfering with the existing layout.

Although the contrast between the intervention and the existing structure is traditional with built heritage (Fernández, 2007), the collage proposed by the modes of approach from the inside offers interesting qualities for the school space, as it multiplies the options available to students and teachers, by integrating novelties into pre-existing structures.

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Architecture and furniture collaborate to shape the space, confirming they are relevant tools to transform traditional school settings, encouraging new senses with few elements. This implies a critical acknowledgment of the existing school space and time, differentiating between what can be adjusted and what is worth keeping (Giardiello, 2017).

Low-scale interventions would allow a progressive intervention, sometimes supported in actions by fragments, which incorporate the temporal variable (Lanz & Pendlebury, 2022), that keeps pace with the needs and possibilities of the educational community and its teaching practices, adapting to different school contexts. This implies thinking about school time in terms of implementing modifications, such as reforming the choreography of school activities and using concrete means of intervention.

The challenges of introducing variants to traditional environments, such as classrooms, are recognized, as users often admit their resistance or inertia in the face of change, as some post-occupation studies suggest (Lourenço, Alegre & Heitor, 2023). The management of modifications and adaptation to change are a fascinating chapter of school renovation that deserves particular attention on a case-by-case basis, depending on the different educational policies and the history of each school (Blanc, Cattaneo & Serra, 2023). In this way, it would be possible to use how the approaches are analyzed. However, they would have to be critically adapted in their application, integrating the educational community into the process. The substitution of uses, replacing a classroom with an open place for meetings and informal study, as happens in Nair and Fielding (Nair, Fielding & Lackney, 2020) or in Hertzberg (Hertzberger & de Swaan, 2009), the transformation of the classroom to combine activities of different groups, through the arrangement of a macro-object, by Mandrup (GENTOFTE KOMMUNE, 2013), or the introduction of new furniture to promote different interpersonal relationships, as Eslava and Tejada do (Eslava Cabanellas, 2023), are more than a physical modification, but also induce changes in social practices. Thus, these interventions are understood as pedagogical actions in themselves, with the ability to affect the character of the entire school by offering diverse possibilities that go beyond the initial requirements.

CONTRIBUTION OF AUTHORS CREDIT

Conceptualization, A.P.I.; Data Curation, A.P.I.; Formal analysis, A.P.I.; Acquisition of financing, A.P.I; Research, A.P.I.; Methodology, A.P.I., M.G.V.; Project Management, A.P.I.; Resources, M.G.V., F.G.; Software, M.G.V., F.G.; Supervision, A.P.I.; Validation, A.P.I., M.G.V., F.G.; Visualization, M.G.V., F.G.; Writing – original draft, A.P.I.; Writing – revision and editing, A.P.I., M.G.V., F.G.

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BIBLIOGRAPHIC REFERENCES

Acaso, M. (2018). Architecture and Interior Design as Key Elements in Changing the Education Model en S. Borri (Ed.), The Classroom has broken. Changing School Architecture in Europe and across the World (pp. 259-266). Florence: INDIRE.

Barrán Casas, P. (2020). La sistematización de la arquitectura escolar pública. Orígenes, difusión internacional y desarrollo en el Río de la Plata (1955-1973) [Tesis doctoral, Universidad de la República]. Portal Colibri. https://www.colibri.udelar.edu.uy/jspui/handle/20.500.12008/26884

Blanc, M. C., Cattaneo, D., y Serra, M. S. (2023) ¿Viejos edificios para nuevas infancias? El devenir de una escuela centenaria en Rosario, Argentina. CABÁS, (30), 99-116. https://doi.org/10.35072/CABAS.2023.74.92.007

Bonsiepe, G. (2005). Del objeto a la interface. Mutaciones del Diseño. Buenos Aires: Infinito.

Bronfenbrenner, U. (1987). La Ecología del desarrollo humano. Experimentos en entornos naturales y diseñados. Barcelona, Buenos Aires, México, Paidós.

Cabrera Recoba, A. (2021). Aportes para el reproyecto de conjuntos habitacionales vulnerables. Micro acciones que promueven la exterioridad. Habitat y sociedad, (14), 339-352. https://doi.org/10.12795/HabitatySociedad.2021.i14.18

Castro, J. (2007). Del banco fijo a la mesa colectiva. Vieja y nueva educación. Montevideo: Ministerio de Educación y Cultura.

Chipa, S., y Orlandini, L. (2019). Dall'aula al cluster didattico: l'innovazione che guarda al futuro con le radici nel passato. Pedagogia Oggi, XVII, 17(1), 49-66. https://doi:10.7346/PO-012019-04

Dussel, I. (2020). The Shifting Boundaries of School Subjects in Contemporary Curriculum Reforms. Zeitschrift für Pädagogik (5), 666-689. https://doi.org/10.3262/ZP2005666

Eslava-Cabanellas, C. (2017). 'Ábitacolo' de Bruno Munari: Infancias domésticas contemporáneas. Revista Proyecto, Progreso, Arquitectura (16), 102-115. https://doi.org/10.12795/ppa.2016.i16.07

Eslava Cabanellas, C. (2023). Hextable: una mesa en crecimiento. Un proyecto desde lo común. Dearq, 1(35), 41-52. https://doi.org/10.18389/dearq35.2023.04

Eslava Cabanellas, C., y Fernández Angosto, A. (2020). El tejido vivo de las relaciones humanas en el espacio de la escuela infantil. A&P Continuidad, 7(13), 104-115. https://doi.org/10.35305/23626097v7i13.283

AS / Vol 43 / N° 67 / 2025
ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Fernández, R. (2007). Obra del tiempo: Introducción a la teoría y la práctica de la gestión integral del patrimonio urbano-arquitectónico. Concentra.

Flora, N., y Iarruso, F. (2017). Progetti Mobili. Lettera Ventidue.

Fontana, M. P., y Mayorga Cárdenas, M. (2017). ¿Pueden los patios escolares hacer ciudad? Proyecto, Progreso, Arquitectura (17), 116-131. https://revistascientificas.us.es/index.php/ppa/article/view/3341/3905

GENTOFTE KOMMUNE. (2013). Munkegaardsskolen, 1949 – 2013, Municipal school restored and revitalized. Kopenhagen. https://designblog.rietveldacademie.nl/wp-content/uploads/2015/03/MU-Folder-sk%C3%A6rmudgave-MR.pdf

Giardiello, P. (2017). Nel/Sul. Frammenti di una riccerca (impaziente). Lettera Ventidue.

Giardiello, P. (2019). Multifunctional interior object. Aracne.

Gislason, N. (2015). The Open Plan High School, Educational Motivations and Challenges en P. Woolner (Ed.), School Design Together (pp. 101-119). London: Routledge.

Hartley, D. (2003). New Economy, New Pedagogy? Oxford Review of Education, 29(1), 81-94. www.jstor.ord/stable/1050731

Heitor, T. (Ed.). (2011). Parque Escolar. 2007-2011. Intervenção em 106 escolas. Intervention in 106 schools. Parque Escolar.

Hertzberger, H., y de Swaan, A. (2009). The Schools of Herman Hertzberger. Alle scholen. Rotterdam: 010.

Kozlovsky, R. (2016). The Architectures of Childhood: Children, Modern Architecture and Reconstruction in Postwar England. Routledge.

Lacaton, A., Vassal, J.-P., y Walker, E. (2022). Lacaton y Vassal, espacio libre, transformación, habiter. Museo ICO, Puente editores.

Lanz, F., y Pendlebury, J. (2022). Adaptative reuse: A Critical Review. The Journal of Architecture, 27(2-3), 441-462. https://doi.org/10.1080/13602365.2022.2105381

Lippman, P. C. (2010). Evidence-Based Design of Elementary And Secondary Schools. A responsive Approach to Creating Learning Environments. Wiley y sons. .

Lippman, P. C. (2023). An Ecological Approach for Creating Dynamic Learning Environments en P. C. Lippman y E. A. Matthews (eds.), Creating Dynamic Places for Learning. An Evidence Based Design Approach (pp. 221-252). Singapore: Springer. https://doi.org/10.1007/978-981-19-8749-6_11

Lippman, P. C., y Mathews, E. (2018). Re-imagining the open classroom en S. Alterator, y C. Deed, School Space and its Ocuppation. Conceptualising and Evaluating Innovative Learning Environments (pp. 63-85). Boston: Brill.

Lourenço, P., Alegre, A., y Heitor, T. (2023). The (Re)Desiging of the Educational Environment in Portugal. What is Changing? ICERI2023 Proceedings, (pp. 6385-6393). Sevilla. https://doi.org/10.21125/iceri.2023.1591

AS / Vol 43 / N° 67 / 2025
ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Marina, J. A. (2017). El bosque pedagógico: y como salir de él. Ariel.

Mayoral-Campa, E., y Pozo-Bernal, M. (2017). Del aula a la ciudad. Arquetipos urbanos en las escuelas primarias de Herman Hertzberger. Proyecto, progreso y arquitectura, (17), 100-115. https://doi.org/10.12795/ppa2017.i17.07

Mirchandani, N., y Wright, S. (Eds.). (2019). Future Schools. Innovative Design for New and Existing School Buildings. RIBA Publishing.

Nair, P. (2014). Blueprint for tomorrow. Redesigning Schools for Student-Centered Learning. Harvard Education Press.

Nair, P., Fielding, R., y Lackney, J. (2020). The Language of School Design: Design Patterns for 21st Century Schools. Designshare.

Nedel, M. Z., y Buzzar, M. A. (2020). El Future Classroom Lab de Bruselas: modelo internacional de la clase del siglo XXI. A&P Continuidad, 7(13), 82-91. https://doi.org/10.35305/23626097v7i13.271

Opertti, R. (2019). Miradas educativas desde la comarca y el mundo. Universidad Católica del Uruguay.

PARTNERSHIP FOR SCHOOLS. (2008). An Introduction to Building Schools for the Future. Partnership for Schools.

Pinau, P., Dussel, I., y Caruso, M. (2001). La escuela como máquina de educar. Tres escritos sobre un proyecto de la modernidad. Paidós.

Postiglione, G. (2018). L'intervento sull'esistente come "ri-scrittura" dello spazio en F. Lanz, Patrimoni innatesi. Reusare per valorizzare (pp 245-252). Siracusa: Lettera Ventidue.

Preston, M. (2023). Inventer l'école, penser la co-création. Brétigny-sur-Orge, Nevers: CAC Brétigny et Tombolo Presses.

Ripani, M., y Muñoz, M. (Eds.). (2020). Plan Ceibal 2020. Desafíos de innovación educativa en Uruguay. Fundación Ceibal.

Scott, C. L. (2015). The Futures of Learning 3: What Kind of Pedagogies for the 21st century? UNESCO. Education Research and Foresight. Working Papers, 15(107), 1-21. https://unesdoc.unesco.org/ark:/48223/pf0000243126.locale=es

Till, J., y Schneider, T. (2005). Flexible housidng: The means to the end. Architectural Research Quarterly, 9(3-4), 287-296. https://doi.org/10.1017/S1359135505000345

Toraldo di Francia, C. (2015). Sistema Parete Integrato. https://www.cristianotoraldodifrancia.it/sistema-parete-integrato/

Van Eyck, A. (2021). El niño, la ciudad y el artista. Fundación Arquia.

Wells, R. (2016). A Learners Paradise. How New Zealand is reimagining Education. TechTeam Press.

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REINFORCEMENT USING REINFORCED CONCRETE AT THE BEGINNING OF THE 20TH CENTURY IN A SIMPLE MASONRY NEO-GOTHIC TEMPLE WITHIN A SEISMIC CONTEXT

REFUERZO CON HORMIGÓN ARMADO A PRINCIPIOS DEL SIGLO XX EN UN TEMPLO NEOGÓTICO DE ALBAÑILERÍA SIMPLE BAJO UN CONTEXTO SÍSMICO

REFORÇO COM CONCRETO ARMADO NO INÍCIO DO SÉCULO XX EM UM TEMPLO NEOGÓTICO DE ALVENARIA SIMPLES EM UM CONTEXTO SÍSMICO

Figure 0. Confinement of the rose window on the eastern facade of the Church of Santa Filomena. Source: Preparation by the authors.

This research comes from the postgraduate thesis in the Master's Degree in Architectural Heritage Intervention of the University of Chile

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RESUMEN

El alto nivel de vulnerabilidad sísmica de las estructuras históricas de albañilería simple de ladrillo requiere de buscar las técnicas de intervención más adecuadas basadas en la teoría y en la experiencia empírica de su desempeño sísmico. Sin embargo, si una determinada técnica no cumple con algunos de los criterios de intervención presentados por ICOMOS (International Council on Monuments and Sites) como la autenticidad, ¿Cómo podemos validar su uso? En la presente investigación se estudia el efecto de los refuerzos de hormigón armado incorporados producto del terremoto de Talca del año 1928 (Ms 8.3) en la Iglesia de Santa Filomena, la que es un ejemplo de los templos neogóticos de albañilería simple de ladrillo en Santiago de Chile, siendo una de las tipologías más vulnerables a sismos. A partir de su desempeño sísmico histórico y un análisis de los criterios de intervención en estructuras patrimoniales, se busca dar una respuesta a la validación del uso del hormigón armado como una técnica de intervención viable bajo un contexto altamente sísmico que ha sido utilizada desde hace al menos 100 años en Chile como refuerzo.

Palabras clave: neogótico, albañilería, hormigón, sismo, ingeniería civil.

ABSTRACT

The high seismic vulnerability of historic simple brick masonry structures requires searching for the most appropriate intervention techniques based on the theory behind and empirical experience of their seismic performance. However, if a given technique does not meet some of the intervention criteria presented by ICOMOS (International Council on Monuments and Sites), such as authenticity, how can we validate its use? This research studies the effect of the reinforced concrete reinforcements incorporated after the 1928 Talca earthquake (MMI 8.3) in the Santa Filomena Church, which is an example of the simple brick masonry neo-gothic temples in Santiago de Chile, one of the most vulnerable typologies to earthquakes. Using its historical seismic performance and analysis of intervention criteria for heritage structures, this article seeks to provide an answer behind the validation of using reinforced concrete, which has been used for at least 100 years in Chile as reinforcement, as a viable intervention technique within a highly seismic context.

Keywords: neo-gothic, masonry, concrete, earthquake, civil engineering.

RESUMO

O alto nível de vulnerabilidade sísmica das estruturas históricas de alvenaria de tijolos simples exige a busca das técnicas de intervenção mais adequadas com base na teoria e na experiência empírica de seu desempenho sísmico. Entretanto, se uma determinada técnica não atende a alguns dos critérios de intervenção apresentados pelo ICOMOS (International Council on Monuments and Sites), como a autenticidade, como podemos validar seu uso? Esta pesquisa estuda o efeito dos reforços de concreto armado incorporados após o terremoto de Talca de 1928 (Ms 8.3) na Igreja de Santa Filomena, que é um exemplo dos templos neogóticos de alvenaria de tijolos simples em Santiago do Chile, sendo uma das tipologias mais vulneráveis a terremotos. Com base em seu desempenho sísmico histórico e em uma análise dos critérios de intervenção em estruturas patrimoniais, procuramos responder à validação do uso do concreto armado como uma técnica de intervenção viável que tem sido usada há pelo menos 100 anos no Chile como reforço em um contexto altamente sísmico.

Palavras-chave: neogótico, alvenaria, concreto, terremoto, engenharia civil.

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INTRODUCTION

When proposing a reinforcement for a historical brick masonry structure, the concept of not incorporating reinforced concrete elements must be kept in mind for the criterion of authenticity, which indicates that the intervention must respect the elements' integrity and a structure's behavior as a reflection of a construction technology typical of its time. The difference between the temporary and functional development of a historical brick masonry structure and the reinforcement by reinforced concrete initially produces a rejection when using it as a valid reinforcement option from a heritage point of view. However, this idea may be justified based on practical experience because reinforced concrete reinforcements can produce problems from increased mass and modification of rigidity, especially in buildings with poor-quality masonry (Barrientos et al., 2024). It is also a technique that is not cost-effective, given the time required for its implementation (Borri et al., 2008). This has led to a rejection of using reinforced concrete for interventions in historic structures, which can be problematic as this limits the possible intervention options. Therefore, it is proposed that the authenticity criterion should be weighted with the structural security criterion, which provides a measure of the solution's effectiveness in improving the structure's performance and even discusses re-evaluating the meaning of authenticity based on the local context.

In the case of Chile, good seismic performance of historical masonry structures is necessary to ensure their conservation over time because earthquakes have caused the irretrievable loss of many of them. The 2010 Maule earthquake (Mw 8.8) damaged 60% of the simple masonry churches (Barrientos et al., 2024), and in particular, 51% of the Churches in Rancagua had severe damage and 12% collapsed (Goic, 2010). Improving seismic behavior requires searching for the most appropriate intervention techniques for each typology based on the theory and empirical experience of its historical seismic performance. This is the focus of this study, to analyze the effect on the seismic behavior of a historical simple masonry structure that was reinforced with reinforced concrete at the beginning of the 20th century, when structural design codes were not yet developed or there were complex methods of structural analysis, at an intermediate point between the introduction of reinforced concrete in Chile and its positioning as the preferred construction material (Pérez Oyarzún et al., 2021).

The case study presented is the Church of Santa Filomena, a characteristic example of the neo-Gothic temples of simple brick masonry in Santiago, which, due to the Talca earthquake of 1928 (MMI 8.3), was reinforced by horizontal reinforced concrete confinement elements. Since its reinforcement, the structure has faced at least five earthquakes of over 8.0. This study seeks to answer the following question: Would the structure have had a

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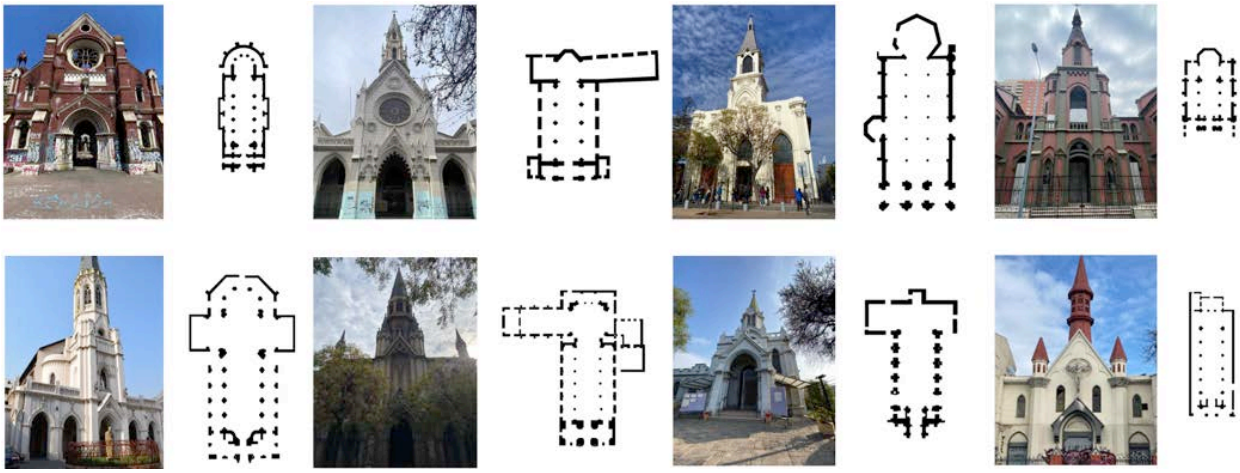

Figure 1. Neo-Gothic simple masonry temples in Santiago de Chile. Source: Preparation by the authors.

different behavior if it had not been reinforced in 1928? This study aims to evaluate whether using reinforced concrete reinforcements can be a viable option for historical simple masonry structures in a country under a seismic context that respects the criteria for intervention in heritage structures.

Neo-Gothic brick masonry temples

The neo-Gothic emerged in England during the 18th century as a reinterpretation of the Gothic language, a movement that did not follow the same structural laws, only the appearance. The main architectural Gothic elements were chosen and applied considering the economic reality of the time and the new construction techniques. The neo-Gothic temples in Santiago de Chile are commonly structured using three naves arranged on a basilical or Latin cross plan, and around the central nave, there are two arcades of ogival form arches supported on fasciculated pillars that transfer the weight of the roof through the clerestory to the foundations. The seismic demands and the absence of skilled labor in Chile prevented the development of ribbed vaults, replaced by carpentry vaults using the corbelled vault method, a lightweight solution that does not produce lateral thrusts. Therefore, using flying buttresses or building with the same constructive principles as European Gothic was unnecessary.

The historical description of the neo-Gothic Catholic temples built between 1850 and 1950 in Santiago de Chile by Mirtha Pallarés (2015) was used as the basis for this research. Figure 1 presents the eight neo-Gothic temples initially built based on simple brick masonry considered in this study. During the Maule earthquake of 2010 (Mw 8.8), the neo-Gothic church with simple brick masonry was the typology that presented a higher rate of damage compared to other churches belonging to different architectural styles with the same materiality, such as neoclassical or colonial. Due to their constructive particularities, they had severe damage in 66% of the cases (Palazzi Chiara, 2019). This

METHODOLOGY

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Figure 2. Main facade of the Church of Santa Filomena. Source: Preparation by the authors.

high seismic vulnerability of neo-Gothic temples is controlled by failure mechanisms associated with the slenderness of the structural elements and the lack of connectors between walls that allow an effective box behavior (Palazzi Chiara et al., 2020).

Church of Santa Filomena

The Church of Santa Filomena (Figure 2) is located in Santiago de Chile, on the north side of the Mapocho River in the commune of Recoleta. This sector was known as "La Chimba" during the colonial period, and until the end of the 19th century, the low land value attracted several religious orders to settle in a strategic point of the capital next to

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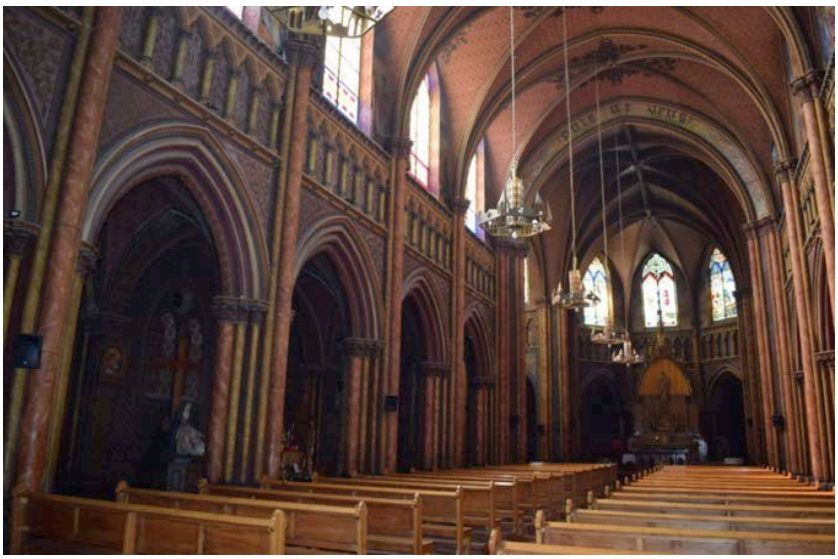

Figure 3. The central nave of the Church of Santa Filomena. Source: Preparation by the authors.

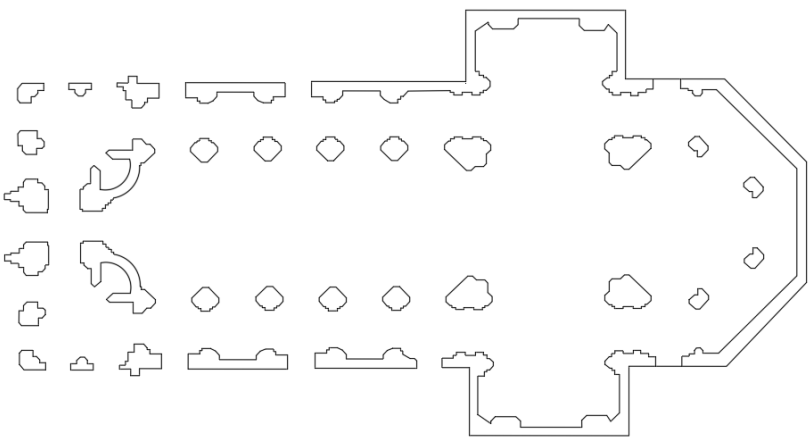

Figure 4. Floor plan of the Church of Santa Filomena. Source: Preparation by the authors based on the plans of the DUOC Foundation (1996).

a population with limited resources with whom they could continue their evangelizing work. The church's materialization was carried out as one of the charitable actions promoted by the encyclical Rerum Novarum of Pope Leo XIII and the work of the priest Marchant Pereira to satisfy social needs and educate in the Catholic faith (Hermosilla & Ortega, 1995). The Franciscan Friar Andresito was in charge of planning the temple; the design and construction were commissioned to the French architect and engineer Eugene Joannon Croizer in 1892 and was completed in 1894.

Of the eight neo-Gothic temples presented in Figure 1, the Church of Santa Filomena is the largest structure (49 m long and 21 m wide), with high slenderness of walls (1:12) and the only one with a wall density in both directions below the average; 4% in the longitudinal and 2% in the transverse direction, when the average wall density in the neo-Gothic temples of Santiago is 7% and 4%, respectively (Sáenz Muñoz, 2023). It has been a Historical Monument since 1995 (Ministry of Education [MINEDUC], 1995), and its reinforced concrete reinforcements are visible to the naked eye from the outside.

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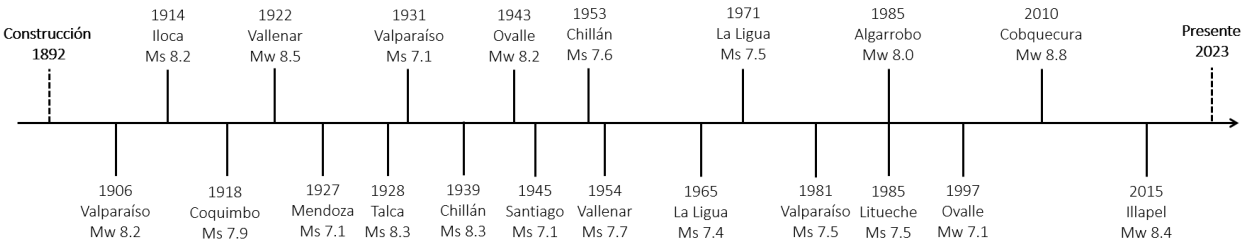

Figure 5. Timeline of relevant earthquakes in Santiago with a magnitude of over 7.0. Source: Preparation by the authors.

The structure's perimeter on the ground floor comprises simple brick masonry walls with 70 cm thick and 840 cm high lime mortar. Inside, the 200 cm diameter polylobed pillars of the masonry form arches receive the weight of the clerestory (Figure 3). The four pillars connect the longitudinal naves and the transept in the intersection. The lateral naves and transept walls work as shear walls that stiffen the structure in both directions; on the other hand, the clerestory and the arcades act as a system of frames that transfer the weight from the roof to the foundations (Figure 4).

The tower comprises simple brick masonry at the base up to 15 m in height. From this point to the tower's summit, unlike the rest of the structure, its construction system is brick masonry and reinforced concrete (Sáenz Muñoz, 2023). Although the church's construction was completed in 1894, it did not include the tower due to a lack of resources to complete the project. It was not until 1913 that the funds were gathered, and Eugenio Joannon was hired again to complete it. As an architect and engineer, he decided to continue building the tower by modifying the system. Unlike the simple masonry base, he proposed that the rest of the tower be made of brick and reinforced concrete masonry. This research does not address the tower's influence on the main structure because it does not constitute a reinforcement, but rather a technological update with the construction systems of the time.

Reinforced concrete reinforcements

Figure 5 presents a timeline of all the earthquakes of over 7.0 that have impacted the city of Santiago. Since the construction of the Church of Santa Filomena began in 1892, it has been subjected every 6 years to an earthquake of around 7.0 in magnitude and every 15 years to one of about 8.0.

The church was built about 15 years before the introduction of reinforced concrete in Chile (Duarte, 2009), so this type of structure was built based on simple brick masonry with lime mortar and without reinforcements in wall transepts. According to Hermosilla and Ortega (1995), the 1928 Talca earthquake (Ms 8.3) produced fissures around the rose windows of the transept, and, therefore,

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Figure 6. Reinforced concrete reinforcements in west transept. Source: National Monuments Council [CMN] (2008).

the structure was reinforced by reinforced concrete elements. This reinforcement consisted of confining the rose windows using a concrete frame formed by two chains and two pillars (Figures 6 and 8). A concrete chain was arranged around the perimeter of the walls at half height and the level of the crowning (Figures 6 and 7). The thickness of the masonry walls is 70 cm, and although it is not possible to observe the depth of the confinement inside the structure, it is enough that the concrete elements cross the wall throughout its thickness. The height of the confinement elements is approximately 20 cm for the chains that run around the perimeter (Figure 7) and 50 cm for the elements of the rose windows (Figure 8). These reinforcements are symmetrical to the longitudinal axis of the structure. Since the reinforcement date in 1928, some adjoining side spaces have been added to the church, and some minor repairs were made after the 1985 earthquake but have not been reinforced.

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Figure 7. Reinforced concrete reinforcements crowning of the clerestory. Source: Preparation by the authors.

Figure 8. Reinforced concrete reinforcements in east transept. Source: Preparation by the authors.

RESULTS

Effect of reinforcements on seismic behavior

An earthquake selects the most vulnerable portions of a structure, called macro-elements, which have a behavior relatively independent of the structure's overall response (Giuffré, 1991), controlled by the type of joint with the adjacent walls and their dimensions (Lourenço et al., 2022). In church typology structures, the common macro-elements are the facade, narthex, tower, lateral or transverse walls, transept, and apse (Doglioni, 2000). Due to the presence of macro-elements in a structure, it can collapse according to each macro-element's different means of failure. Therefore, a structure is seismically vulnerable, i.e., it can present a certain level of damage since each macro-element has a probability of failure associated with a certain seismic intensity. When an overall box

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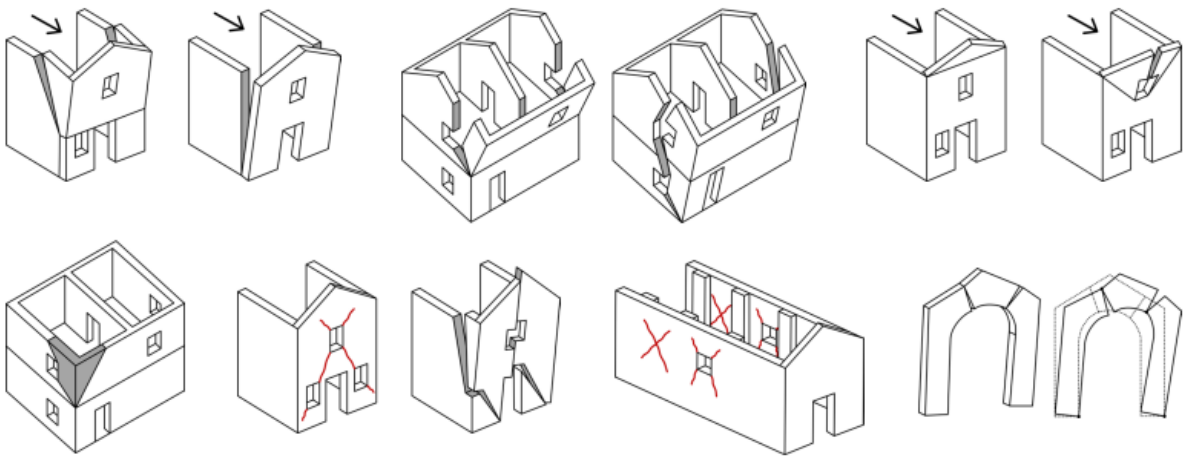

Figure 9. Examples of collapse mechanisms in masonry structures. Source: Directive of the President of the Consiglio dei Ministerri [DPCM] (2011).

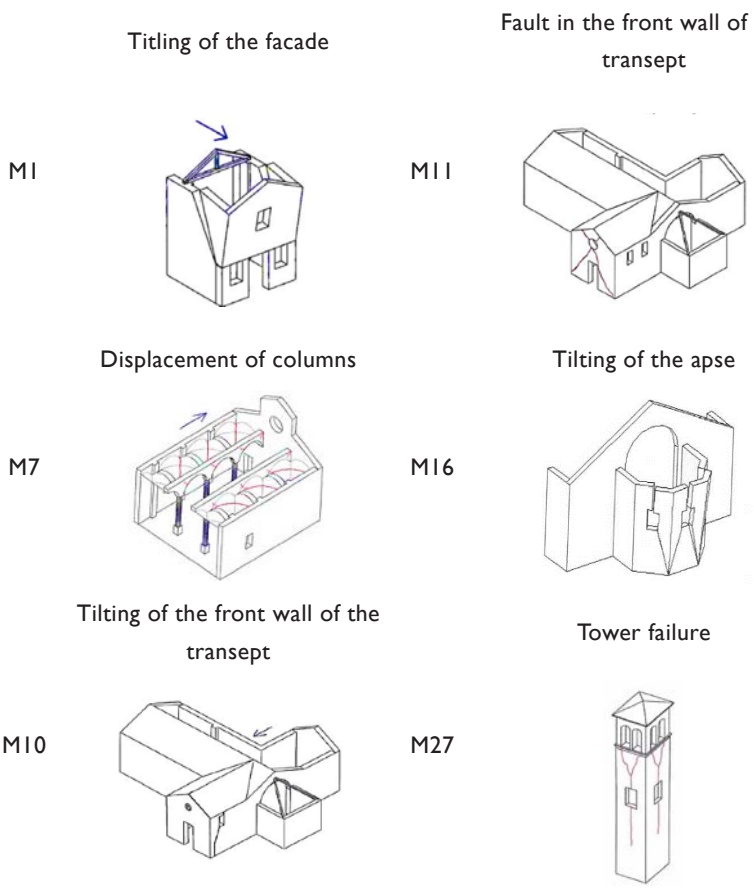

Figure 10. Collapse mechanisms observed in the church. Source: Directive of the President of the Consiglio dei Ministerri [DPCM] (2011).

behavior is not guaranteed due to the lack of confinement and the low strength of the masonry, the walls become vulnerable to out-of-plane failures (Figure 9). This is the leading cause of damage or collapse of existing masonry structures (Casapulla et al., 2017).

According to Hermosilla and Ortega (1995), the 1985 earthquake (Mw 8.0) produced cracks in the walls of the apse, partial collapses, cracks in the front walls, damage to the form arches,

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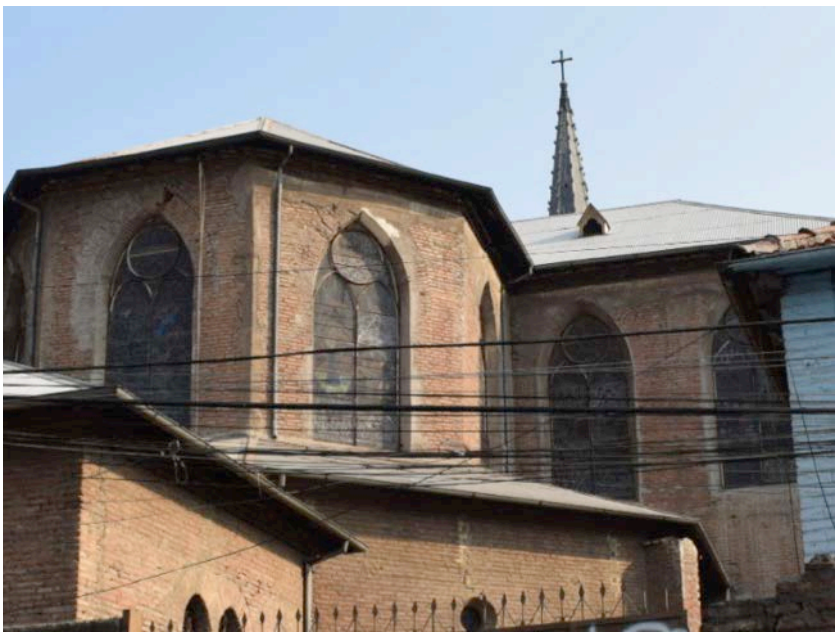

Figure 11. State of the apse prior to the Maule earthquake (Mw 8.8). Source: National Monuments Council [CMN] (2008).

Figure 12. State of the apse after the Maule earthquake (Mw 8.8). Source: Preparation by the authors.

and bricks crumbling. Based on a survey of structural damages carried out in 2023 (Sáenz Muñoz, 2023), it was determined that the damages the structure has are moderate and from the activation of mechanisms by faults inside and outside the plane of the walls, such as: tilting of the facade, displacement of columns, tilting of the front wall of the transept, failure in the front wall of the transept, tilting of the apse and failure of the tower (Figure 10). Therefore, the damages repaired after the 1985 earthquake reappeared, possibly due to the 2010 earthquake (Mw 8.8) or the 2015 Illapel earthquake (Mw 8.4).

The structural typology of the neo-Gothic churches of simple brick masonry has specific constructive characteristics that imply a greater seismic vulnerability, such as high slenderness of walls, absence of connecting elements, and a wide variety of macro-elements, among others. However, in the case of the Church of

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Santa Filomena, since its last reinforcement in 1928, it has been subjected to 5 earthquakes of over 8.0. The damages are minor, and the most important thing is that the structure has not collapsed. Why has it not suffered a collapse in all this time?

In Figure 11 and Figure 12, the damage to the church's apse before the Maule earthquake in 2010 can be compared with the current state. It is observed that damage has reappeared in the keys of the arches and vertical fissures in the meeting of walls, which coincides with areas that were intervened prior to 2010. Similarly, if one compares the vertical fissures under the rose windows in the transept walls in Figures 6 and 8, these fissures have remained stable even after the earthquakes.

Have the built-in reinforced concrete reinforcements worked properly? Characterizing a good seismic behavior of a structure from the function of a single element can be a simplification of the problem, but the simple masonry churches that had severe damage after the 2010 earthquake (Mw 8.8) did not have elements that allowed an adequate box behavior (Palazzi Chiara, 2019). In the Church of Santa Filomena, the reinforced concrete reinforcements incorporated in 1928 fulfill two main roles: connecting the walls to avoid failure in the joints and avoiding failure outside the plane due to tilting.

Validation of the use of reinforced concrete reinforcements

Prior to the creation of ICOMOS in 1965, UNESCO (United Nations Educational, Scientific and Cultural Organization) held the Athens Conference in 1931 (UNESCO, 1931), where its resolution N°5 indicates the following regarding the use of modern materials for the consolidation of old buildings:

> "The judicious use of all modern technology resources is approved, especially that of reinforced cement (...) These means of reinforcement must be concealed so as not to alter the appearance and character of the building."

This conference was contemporary with the reinforcements used in the Church of Santa Filomena and allows one to understand that the reinforced concrete technique as reinforcement was already applied globally to intervene in historic structures. Additionally, it is indicated that the "appearance" and "character" of the building should not be altered, which is currently understood more comprehensively.

The safeguarding of the "aesthetic and historical" values of heritage structures is recognized by the Venice Charter of 1964 (International Council on Monuments and Sites [ICOMOS], 1965)

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and the principles of the ISCARSAH committee in the Zimbabwe Charter of 2003 (ICOMOS, 2003). Both charters presented by ICOMOS (International Council on Monuments and Sites) defined the necessary criteria to be considered when intervening in a historical value structure respecting its values and attributes. When a structure of historical value is intervened, the desired structural safety goes beyond avoiding structural failures and the loss of lives. It is also necessary to "safeguard the intrinsic values of the property" (Peña Mondragón & Lourenço, 2012). Currently, the Chilean standard for intervention in heritage buildings NCh3389:2020 (INN, 2020) presents different intervention criteria separated between design, structural, and heritage criteria. It indicates that the intervention project must consider the "heritage values and attributes" and that the requirements must "achieve both structural safety and the integrity of the heritage value."

The ICOMOS intervention criteria and the Chilean regulations are not explicit with a single concept or organized by a hierarchy of importance because, for each structure in its particular context, the team of professionals will use the intervention criteria differently to achieve the final objective, which is to restore the built element as a whole.

The Zimbabwe Charter of 2003 (ICOMOS, 2003), in section 3.3.7, indicates the following regarding the use of new intervention techniques:

> The choice between "traditional" and "innovative" techniques must be weighed on a case-by-case basis, always giving preference to those that produce a less invasive effect and are more compatible with the values of cultural heritage while never forgetting to comply with the requirements imposed by safety and durability."

Among the existing intervention criteria, such as reversibility, compatibility, and minimum intervention, the analysis to justify using reinforced concrete reinforcements can be approached from two main criteria (Sáenz Muñoz, 2023): authenticity and structural safety. The definitions of these criteria for this study are as follows:

- Authenticity: Refers to the integrity of a structure's elements as a reflection of a constructive technology typical of its time. Therefore, the fundamental principles of the structure's behavior and its original materiality must be preserved.
- Structural safety: If the structure has damage, the intervention must consider the possible artistic and cultural damages in the structure and prioritize safeguarding the property's intrinsic values.

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It would have been reasonable to make a local repair of the damages produced after the earthquake of 1928 without having corrected some of the seismic design problems that the structure could present in the long term and that had been observed in multiple churches of simple masonry product of previous earthquakes. However, the structural reinforcement of the Church of Santa Filomena is a clear example that has managed to preserve the structure until now only with moderate damage and without altering its earthquake-resistant behavior and architectural values or attributes. If another reinforcement option had been chosen in the past that prioritized authenticity, it is possible that the structure would have suffered more significant damage and even collapsed. Therefore, although the concept of authenticity in its most purist and rigorous conception is not respected by this type of intervention with reinforced concrete, it should be taken into consideration that Chile is a highly seismic country, and this local context invites us to consider authenticity under a new gaze where structural safety takes a more significant role intending to preserve the heritage over time. These new considerations may allow the recent Chilean standard for intervention in heritage buildings NCh3389:2020 (National Institute of Standardization [INN], 2020) to be updated to better adapt to the safety requirements that our seismicity imposes on heritage.

CONCLUSIONS

Is the use of reinforced concrete reinforcements justified in intervening in historical structures? The answer will depend on each structure since it requires a unique analysis. However, in the case of simple brick masonry structures located in countries with a highly seismic context, such as Chile, the most appropriate intervention techniques based on theory and empirical experience of their historical performance should be sought to improve their seismic behavior.

The use of reinforced concrete in restoration has generated controversy over time. From the beginning to the middle of the 20th century, it was thought to be the solution for any deterioration in historical buildings. Until the end of the same century, it was observed that, in some cases, interventions with reinforced concrete manifested incompatibilities with the elements due to the internal characteristics of the materials or the work (Esponda, 2004), which can produce structural issues due to changes in its mass and rigidity. However, if executed correctly, they avoid typical failures in structures of this type that can trigger a collapse. As indicated above, it is possible to argue that this type of reinforcement does not meet the criterion of authenticity in its strict definition for brick masonry structures, given the difference between both systems and constructive techniques. Nevertheless, each intervention criterion

must be weighed through a cost-benefit analysis to ensure the best heritage conservation over time and in the local context, which is highly seismic in this research case. Therefore, the invitation is to consider the authenticity criterion with a new look where structural safety is more important.

Have the reinforced concrete reinforcements incorporated into the Santa Filomena Church worked properly? These have fulfilled two leading roles: to connect the walls to avoid failures at the joints and to avoid failures outside the plane due to tilting. It should be borne in mind that the structure has been subjected to at least five earthquakes of over 8.0 in magnitude since the last reinforcement in 1928, and no severe damage or collapse has occurred. These reinforcements were executed when there were still no design codes or complex structural analysis methods. They have managed to preserve the structure until now only with moderate damage and without altering the earthquake-resistant behavior or its architectural values or attributes.

The example shown in this research is a specific case of reinforced concrete reinforcement in a historical brick masonry structure that has had good seismic behavior. Thus, the limitation is that the result might not apply to a similar structure. Therefore, in future research, the seismic performance of a more extensive set of cases of historical structures that have been intervened in this way should be compared to understand in greater detail the effect of incorporating reinforced concrete reinforcements that contribute to the building's structural safety while respecting the heritage intervention criteria. It is also proposed that a method that allows systematizing the selection of structural reinforcement techniques with less impact for a specific structural typology be investigated in the future.

CONTRIBUTION OF AUTHORS CREDIT

Conceptualization, S.S.M.; Data curation, S.S.M.; Formal analysis, S.S.M.; Acquisition of financing S.S.M.; Research, S.S.M.; Methodology, S.S.M.; Project management, S.S.M.; Resources, S.S.M.; Software, S.S.M.; Supervision, G.M.S.; Validation, G.M.S.; Visualization, S.S.M.; Writing - original draft, S.S.M.; Writing - proofreading and editing, G.M.S.

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BIBLIOGRAPHIC REFERENCES

Barrientos, M., Palazzi Chiara, N., Alvarado, R., y Sandoval, C. (2024). Preliminary Assessment of a Historic Masonry Church Strengthened by Reinforced Concrete Elements During 1927–1930. The Case of Recoleta Dominica Basilica in Santiago, Chile in Endo, Y., y Hanazato, T. (eds.) Structural Analysis of Historical Constructions. SAHC 2023. RILEM Bookseries, vol 47. Springer, Cham. https://doi.org/10.1007/978-3-031-39603-8_91

Borri, A., Castori, G., y Grazini, A. (2008). Retrofitting of masonry building with reinforced masonry ring-beam. ***Construction and Building Materials, 23***(5), 1892-1901. https://doi.org/10.1016/j.conbuildmat.2008.09.012

Casapulla, C., Giresini, L., y Lourenço, P.B. (2017). Rocking and kinematic approaches for rigid block analysis of masonry walls: State of the art and recent developments. ***Buildings, 7***(3), 69. https://doi.org/10.3390/buildings7030069

Consejo de Monumentos Nacionales [CMN]. (2008). Fotografías de la Iglesia de Santa Filomena durante inspección. Santiago.

Direttiva del Presidente del Consiglio dei Ministri [DPCM] (2011). Valutazione e riduzione del rischio sismico del patrimonio culturale con riferimento alle Norme tecniche per le construzione di cui al decreto del Ministerio delle infrasrutture e dei transporte del 14 gennaio 2008. Gazzetta Ufficialle Della República Italiana, Serie Generale n.47 del 26-02-2011 - Suppl. Ordinario n. 54. https://www.gazzettaufficiale.it/eli/gu/2011/02/26/47/so/54/sg/pdf

Doglioni, F. (2000). Codice di pratica (Linee Guida) per la progettazione degli interventi di riparazione, miglioramento sismico e restauro dei beni architettonici danneggiati dal terremoto umbro-marchigiano del 1997. Bollettino Ufficiale Regione Marche.

Duarte, P. (2009). Innovación constructiva a principios del siglo XX: preámbulo a la modernidad arquitectónica y arquitectura subestimada. ***Revista De Arquitectura, 15***(20), 20-26. https://doi.org/10.5354/0719-5427.2009.27961

Esponda, M. (2004). Evolución de los criterios de intervención con hormigón armado en la restauración de edificios históricos en España y en México [Tesis Doctoral, Universidad Politécnica de Cataluña]. Repositorio cooperativo TDX Tesis Doctorados en XarXa. http://www.tdx.cat/TDX-0426104-104024

Fundación DUOC (1996). Planos de Iglesia Santa Filomena por los alumnos de Dibujo Técnicos del DUOC: Gutiérrez, Velásquez y Mendoza. Santiago, Chile.

Giuffré, A. (1991). Lettura sulla meccanica delle murature storiche. Editorial Kappa, Roma.

Goic, A. (2010). Algunas reflexiones ante el terremoto del 27 de febrero de 2010. Carta a la Diócesis. https://www.iglesia.cl/3965-algunas-reflexiones-ante-el-terremoto-del-27-de-febrero-de-2010.htm

AS / Vol 43 / N° 67 / 2025
ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Hermosilla, P. y Ortega, O. (1995). Parroquia Santa Filomena. Consejo de Monumentos Nacionales. Santiago, Chile. https://www.monumentos.gob.cl/monumentos/monumentos-historicos/iglesia-parroquial-santa-filomena

International Council on Monuments and Sites [ICOMOS]. (1965). Carta internacional sobre la conservación y la restauración de monumentos y sitios (Carta de Venecia de 1964). II Congreso internacional de Arquitectos y Técnicos de Monumentos Históricos. Italia. https://www.icomos.org/images/DOCUMENTS/Charters/venice_sp.pdf

International Council on Monuments and Sites. [ICOMOS]. (2003). Principios para el análisis, conservación y restauración de las estructuras del Patrimonio Arquitectónico. Zimbabue. https://www.icomos.org/images/DOCUMENTS/Charters/structures_sp.pdf

Instituto Nacional de Normalización [INN]. (2020) NCh3389:2020. Estructuras - Intervención en Construcciones Patrimoniales y Edificaciones Existentes - Requisitos del Proyecto Estructural (Chile). https://ecommerce.inn.cl/nch3389202075256

Lourenço, P. B., Pereira, J. M., y Torrealva, D. (2022). Proyecto de estabilización sismorresistente. Cálculos simplificados para el análisis estructural de las construcciones históricas de tierra. Getty Conservation Institute. Los Ángeles.

Ministerio de Educación [MINEDUC]. (1995). Declaración de Monumento Histórico Iglesia Parroquial Santa Filomena. Decreto Excento de Eduacción N°694. Santiago, Chile.

Palazzi Chiara, N. (2019). Seismic fragility assessment of unreinforced masonry churches of Central Chile [Tesis Doctoral, Pontificia Universidad Católica de Chile]. Repositorio Pontificia Universidad Católica de Chile. https://doi.org/10.7764/tesisUC/ING/48356

Palazzi Chiara, N., Favier, P., Rovero, L., Sandoval, C., y de La Llera, J.C. (2020). Seismic damage and fragility assessment of ancient masonry churches located in central Chile. Bulletin of Earthquake Engineering. 18:3433-3457. doi: 10.1007/s10518-020-00831-1

Pallarés, M. (2015). La arquitectura religiosa en Santiago de Chile 1850-1950. Razones de las reminiscencias góticas [Tesis doctoral, Universidad Politécnica de Madrid]. Archivo Digital UPM, Universidad Politécnica de Madrid. https://doi.org/10.20868/UPM.thesis.39862

Peña Mondragón, F., y Lourenço, P.B. (2012). Criterios para el refuerzo antisísmico de estructuras históricas. *Revista de Ingeniería Sísmica,* (87), 47-66. https://doi.org/10.18867/ris.87.45

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ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Pérez Oyarzún, F., Booth Pinochet, R., Vásquez Zaldivar, C., y Muñoz Lozano, Y. (2021). Cimentando el centenario: El hormigón armado en tres edificios del Santiago de Chile a comienzos del siglo XX. ***Atenea*** (523), 39-61. https://doi.org/10.29393/AtAt523-409FPCC40409

Sáenz Muñoz, S. (2023). Reducción de la vulnerabilidad sísmica de la Iglesia de Santa Filomena. Un ejemplo del neogótico de albañilería simple en Santiago de Chile [Tesis de Magíster, Universidad de Chile]. Repositorio Academico de la Universidad de Chile. https://repositorio.uchile.cl/handle/2250/197186

UNESCO (1931). Carta de Atenas. Conferencia de Atenas. Atenas.

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WHAT COLOUR CONSIDERATIONS COULD BE USED FOR ARCHITECTURAL RESTORATION?

QUE CRITÉRIOS CROMÁTICOS UTILIZAR PARA A RESTAURAÇÃO ARQUITETÔNICA?

¿QUÉ CRITERIOS CROMÁTICOS SE PUEDEN UTILIZAR PARA LA RESTAURACIÓN ARQUITECTÓNICA?

Figura 0. Reabilitação Casa Chamboirat, do escritório COVE Architectes. Fonte: Disponível em ArchDaily. (2024), acesso 18 junho 2024.

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RESUMO

Este artigo trata da escolha de cor nas superfícies do patrimônio edificado colocando-a como problema de imagem no âmbito da teoria e da crítica arquitetônica. Aborda-se a imagem como um mecanismo para percepção e memória humana e são apresentados os argumentos defendidos quanto ao uso da cor pelos principais expoentes da teoria da restauração, comparando essa produção teórica frente à realidade cromática de três núcleos urbanos tombados no Brasil. Tais locais refletem a imagem do patrimônio edificado fixada na memória da população brasileira, o que possibilita entendê-los como exemplos paradigmáticos. O trabalho observa as incoerências entre o discurso e a prática nas intervenções cromáticas e traz à luz a importância da teoria da restauração na criação de soluções alternativas. Demonstrando cenários possíveis e possibilidades de intervenções diferentes nas cores das superfícies arquitetônicas, o resultado traz para o debate a importância do conhecimento teórico para uma produção prática coerente com a noção de patrimônio cultural.

Palavras-chave: patrimônio cultural, superfície, cor, teoria, crítica.

ABSTRACT

This article looks at the choice of color on the surfaces of the built heritage as an image problem in the context of architectural theory and criticism. The image is approached as a mechanism for human perception and memory. The arguments defended regarding the use of color by the leading exponents of restoration theory are presented, comparing this theoretical production against the chromatic reality of three urban centers in Brazil. These sites reflect the image of the built heritage fixed in the memory of the Brazilian population, making it possible to understand them as paradigmatic examples. The work observes the inconsistencies between discourse and practice in chromatic interventions and brings to light the importance of restoration theory in creating alternative solutions. Demonstrating possible scenarios and possibilities of different interventions in the colors of architectural surfaces, the result brings to the debate the importance of theoretical knowledge for a practical production coherent with the notion of cultural heritage.

Keywords: cultural heritage, surfaces, color, theory, criticism.

RESUMO

Este artículo aborda la elección del color en las superficies del patrimonio edificado, situándolo como un problema de imagen en el contexto de la teoría y la crítica arquitectónicas. Aborda la imagen como mecanismo de percepción y memoria humanas y presenta los argumentos defendidos por los principales exponentes de la teoría de la restauración en relación con el uso del color, comparando esta producción teórica con la realidad cromática de tres centros urbanos catalogados de Brasil. Estos lugares reflejan la imagen del patrimonio construido fijada en la memoria de la población brasileña, lo que permite considerarlos ejemplos paradigmáticos. La obra observa las incoherencias entre el discurso y la práctica en las intervenciones cromáticas y saca a la luz la importancia de la teoría de la restauración para crear soluciones alternativas. Al mostrar posibles escenarios y posibilidades de diferentes intervenciones en los colores de las superficies arquitectónicas, el resultado trae al debate la importancia del conocimiento teórico para una producción práctica coherente con la noción de patrimonio cultural.

Palabras clave: patrimonio cultural, superficie, color, teoría, crítica.

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INTRODUCTION

Architectural theory encompasses not only the built space but also the social aspects surrounding it, such as the notion of cultural heritage. Heritage, by representing significant moments in human history, serves as a reference to understand collective identity, allowing reflection on who we are, who we were, and how we evolved, both for housing and social organization. Understood as a fundamental element for forming group consciousness, heritage is not restricted to the work of art but encompasses a broader sense of identity and collective memory. Its preservation becomes essential in the face of the need for symbolic references, meanings, and cultural patterns that guide human beings in their life. From an anthropological perspective, the absence of these patterns – understood as systems of symbols and meanings – would result in chaotic human behavior. Culture, as the accumulated totality of these patterns, and heritage, in its material and immaterial dimensions, constitute essential conditions for human existence. In this context, the image plays a central role, acting as a means of communication and transmission of these meanings over time.

The image is an experience comprising memory and imagination; images appear in your brain when you think about something (Barry, 2008). This thought is also explored by Pallasmaa (2013), who links the image to human emotions, arguing that image and imagination make up the mechanism of human perception, thought, language, and memory. However, in architecture, the word "image" has been used to designate the production of an "architecture of the image," which seduces and introduces representations in physical spaces. Hal Foster (2021) contributes to this discussion by contextualizing this phenomenon within a crisis of authenticity in contemporary culture, in which truth is often manipulated and transformed into a spectacle. Foster (2021) addresses the idea of farce as a gimmick to hide complex realities and replace them with simplified, manipulated versions for mass tourism. Faced with this, the idea of the architecture of the image dialogues with Foster's concept of farce (2021) and, in the context of historical cities, reflects a scenographic architecture where buildings operate as mere stages.

Here, the problem of facade colors in architectural restorations is inserted because, to seek an image that dialogues with the meanings and historical meanings of color, it is necessary to understand that the foremost critical challenge today lies in the choice of colors. This decision involves analyzing archaeological remains and considering the possibilities of restoring a particular heritage image, as Aguiar highlighted (2002).

Understanding the relationship between theory and reality contributes to the judicious choice of color in architectural restorations, as the city is changeable in its liveliness. However, chromaticism expresses each historical period's architectural languages, time, and technological capabilities. For this reason, coatings, especially color in architecture, reveal both architectural, anthropological, and political meanings. When analyzing the theory of

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restoration and some Brazilian cases, it is questioned whether the colors reflect theoretical principles of restoration or if they act as an element of maintenance of an image architecture. In the following topics, this issue will be explored. First, however, it is necessary to discuss some theoretical foundations.

METHODOLOGY

Why theory?

When talking about theory, it is common to highlight its role in the area regarding the concepts of history and criticism. However, here, it is not intended to repeat a commonplace concept but to provide the necessary technical concepts. In this sense, in architecture, it should be noted that history studies the past, criticism interprets existing works, and theory is constituted as a discourse on the practice and production of the discipline (Nesbitt, 2008). Colors, although widely studied in architecture, have often been analyzed from formal compositions or interior decoration, while little attention has been paid to the impacts of color on the image of cultural heritage.

Publications in the area of built heritage reveal a common point in the research on color carried out in the West from the mid-20th century: the need for an analysis that goes beyond its technical aspects. This positioning follows the theoretical principles of critical restoration, having in Cesare Brandi its foremost exponent, as stated in his book ***The Theory of Restoration***, published in 1963. In this work, although Brandi (2008) does not deal specifically with architectural color, he addresses the concept of patina, a term that refers to the effect of time on the surfaces of buildings. For the author, patina is a natural phenomenon that results from the passage of time, and its conservation preserves the historical testimonies of architecture. He argues that it is wrong to contradict the very antiquity of the work by modifying its subject matter to simulate a freshness of novelty.

Another publication by Brandi (2009) recommends that the restoration should respect the history of the building, and a return to the original color should be taken with caution. It is a work of critical judgment, where the pictorial prospections must be evaluated to make the decision, which will depend on the historical investigation and the analysis of the value of the original layer, also considering the later stratifications and examining if these also have value.

Every building has color. This was not a relevant issue for centuries, since the buildings were colored with the pigments available in each territory. However, contemporaneity has altered this relationship, either by technological advances that have expanded the chromatic possibilities or by new perceptions influenced by screens and digital media. Given this scenario, we will analyze three Brazilian urban centers to verify whether the colors

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of their facades reflect the principles of critical restoration theory. How do you select the color in the restoration? The answer is not limited to pictorial prospections, and theoretical studies indicate that decisions cannot be based exclusively on this resource. It is necessary to adopt chromatic approaches that are coherent with the nature of the heritage, based on theoretical principles, and built with local policies and urban management. To do so, it is essential to understand the contributions of restoration theorists.

THEORETICAL FRAMEWORK

Color in restoration theory

In the field of restoration, there is a consensus that color is not only a technical issue, but also a critical and interpretive one. However, it is important to emphasize that no single contemporary theoretical strand guides all interventions. This means that, in the West, chromatic decisions, when based on theoretical arguments, can be supported by at least three strands that distance themselves from the notion of pragmatic or strictly functional[1] restoration, and they incorporate cultural, historical, and aesthetic aspects. In this context, we will approach the theory of critical restoration, which achieved international recognition through Brandi's writings and consolidated itself as a reference in the debate on color in restoration.

Brandi (2009) points out that, in architecture, chromatic interventions should be analyzed with caution, as they can compromise the balance of an entire urban complex. Adopting an even more conservative stance, he advocates the possibility of consolidating old layers, but never to return to the visual aspect of the original colors – an intention that he considers "historically absurd". For the author, the search for supposed originality would alter the established and consolidated balance between the building and its urban context, in addition to ignoring the passage of time in the work. He further argues that it is impossible to accurately recreate the chromatic aspect of surfaces in their original period.

Muratore (2010) corroborates this issue and highlights the recognition of coloring the surfaces of buildings as an action of a simultaneously aesthetic and historical character, since the patina represents the passage of time. The researcher reinforces her argument by highlighting the thought of Renato Bonelli, an Italian architect of great relevance in the theoretical and practical field of critical restoration, who shared the same perspective when affirming the irreversibility of time. Similar arguments can be found in Paolo and Laura Mora (1984), for whom the chromatic intervention is not complex due to technical problems but because it involves critical, historical, and aesthetic challenges. Like Brandi, Bonelli, and Muratore, Mora and Mora (1984) emphasize that any chromatic intervention should be as moderate as possible. The authors suggest solutions such as respecting and preserving the layer in its current state, filling in gaps only after extensive documentation, maintaining the patina, or even reproducing it to give the new painting an aspect of natural aging.

1 Although there are several strands within restoration theory, such as "critical-conservative and creative", based on Brandian theory; "pure conservation", which adopts a stance where the historical dimension predominates; and "maintenance-repristination", which emphasizes an analog approach, all converge in respect of the historical value of the cultural property (Kuhl, 2004).

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In line with this thought, Paul Philippot (1966), one of the founders of ICCROM**2**, also stated that patina is a natural process, irreversible and inherent in the passage of time on matter. According to him, it is essential to recognize this modification as part of the work's cycle, since its original state can never be fully restored. In the same vein, Giovanni Carbonara (1997), the foremost contemporary exponent of the theoretical aspect of critical-conservative and creative restoration, argues in his book ***Avvicinamento al restauro*** that the colors of architectural surfaces take on a positive value because they suggest the passage of time. Like Bonelli (1988), he reinforces that the city is lived and enjoyed as an image, color being an essential element in the perceptual experience of the individual with space.

For Carbonara (1997), not only is it impossible to return to the original appearance of the surfaces of an old building, but interventions that introduce a new color depart from the principles of restoration and can lead to the loss of interest in the work as heritage to be preserved. The author emphasizes that the building, together with its context, transforms over time and that the search for an original appearance can, in some instances, take on an even criminal nature insofar as it erases part of history. In a more recent article, Carbonara (2020) also takes a stand against architectural restorations that seek to recover "primitive" colors, arguing that these interventions, although based on historical-philological research**3**, often translate into overly simplified solutions at the operational level.

Other authors argue that interventions that remove the signs of time distance themselves from the theoretical and practical field of restoration, as defended by Maria Grazia Turco of the Sapienza University in Rome. Turco (2018) notes that total renovations erase traces of the past, compromising the connection between the building (text) and the city (context). This intrinsic relationship between the well-built and urban environments is also analyzed by Nicola Santopuoli (2021), who has developed color plans and criticized what he calls "prepackaged recipes" – overly simplified solutions that disregard the relationships between surfaces and the identity of the place. Such arguments reinforce that the idea of color as an image should not be reduced to mere representation or form. It is essential to approach it as a critical problem, as Montaner (2022) points out, interpreting the work in its complexity and avoiding reducing it to purely formal aspects.

Still, within this theoretical framework, it is essential to highlight the Heritage Charters and ICOMOS documents**4** that establish guidelines and reflect consensus among cultural field theorists. Among them, the Venice Charter of 1964 is considered the institution's fundamental document. Although it briefly deals with the topic of colors**5**, this charter is aligned with the critical restoration and reinforces the arguments about the importance of the historical value and image of the listed property.

Given this, there is a consensus among theorists regarding the irreversibility of time and the present moment as the guiding thread of the restoration

2 International Study Center for the Conservation and Restoration of Cultural Property; intergovernmental organization for the preservation of cultural heritage worldwide that operates through research and training programs.

3 Historical research based only on surveys to verify ancient layers of color and philological research based only on analyzing documentary material are insufficient, as colors must be analyzed on a case-by-case basis against the urban context.

4 Icomos is the International Council on Monuments and Sites, a global non-governmental organization associated with UNESCO.

5 Article 6 refers to the idea of conservation of the environment, prohibiting interventions that modify the relationships of volume and color.

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process. This means that it is not enough to carry out historical surveys if, at the same time, the traces of time are erased, forging a past by trying to recreate an image based on previous layers of paint from the idea that they contain historical contributions. It is essential to recognize that the treatment of surfaces must be approached in the restoration intervention from a critical perspective, understanding it, as defended by Aguiar (2002), as a design problem.

RESULTS AND DISCUSSIONS

Current and possible scenarios

Parallel to this theoretical context, since the end of the 1930s, in the first years of the federal preservation agency in Brazil, the Institute of National Historical and Artistic Heritage (Iphan) chose national heritage buildings representative of the Brazilian colonial period. Lia Motta, architect, and officer of the Iphan for many years, notes that, between 1937 and 1967, the entity chose six hundred and forty-five (645) buildings, of which most were located in Minas Gerais (MG), followed by Rio de Janeiro (RJ) and, in third place, by Bahia (BA). Although, since 1967, there has been an expansion of the notion of heritage, the criteria initially adopted by Iphan are still present, as Motta (2008, p.55) points out when stating that this practice established "a powerful social framework of memory that fixed an image of heritage, associated with an architecture with colonial or exceptional features, in the memory of Brazilians." It is precisely because of the strength of this image of heritage, rooted in the social memory of Brazilians, that it becomes possible, when talking about Ouro Preto (MG), Paraty (RJ), and Salvador (BA), to refer, in some way, to several other historical centers recognized as heritage.

The proximity of these three listed nuclei is no coincidence, as it reflects both the process of territorial occupation of Brazil and the first thirty years of Iphan, a period in which the agency's performance was aligned with the political project of modernist intellectuals. In this context, an aesthetic appreciation guided by modernist architects' vision prevailed, highlighting the Baroque style and colonial architecture. This aspect is especially relevant, as it directly influenced the desired chromatic image for these urban centers.

In the colonial period, the architecture of the ***cinquecentrist*** nuclei was predominantly whitewashed, although there were exceptions throughout the Brazilian territory, using clays and other pigments to add color. Over time, the remaining buildings began to incorporate contemporary chromatic practices, and by the 1940s, many buildings that bore witness to the colonial period had undergone significant changes in their colors. This process intensified between the second half of the 19th century and the beginning of the 20th century, a moment that reflects both the technological advancement of the pigment industry, which made it possible to distribute mineral paints and the social desires

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of the population with some purchasing power for an aesthetic renewal. The three historical centers analyzed in this article do not escape this dynamic and have gone through all these moments, in addition to others that emerged later: the formation of their urban centers still in the colonial period, the transition from the 19th to the 20th century, marked by the rise of eclecticism and the popularization of mineral pigments in the coloring of buildings; the strengthening of architectural preservation in the first half of the 20th century, with the institutionalization of these practices in Brazil; the period between the 1960s and 1970s, when the rescue of the history of a place began to be explored as attractive to tourists, and finally, the current context, which, although it is a continuity of this process, presents new issues of the transition from the 20th to the 21st century, where the technology of virtual images and social networks has become an extension of our bodies, influencing our color perception and aesthetic preferences.

These changes in the social context directly impact the colors of architectural surfaces, traditionally treated in Brazil as "layers of sacrifice" – ephemeral and renewable whenever necessary. Even in the cases of institutionally protected cities, architectural and historical particularities make it challenging to adopt a standardized approach to a historic center. This makes it essential to carry out broad studies, which involve not only historical and typological analysis, but also phenomenological approaches. These factors may explain why the Iphan's legal tools do not yet include specific guidelines on chromatic interventions. In Paraty (RJ), Ouro Preto (MG), and Salvador (BA), regulatory documents have been published, but these do not establish clear criteria for the treatment of colors in buildings. Still, recommendations on the subject are found in the local Superintendencies of Iphan or inserted in municipal regulations, to which the Institute's units usually resort.

Motta (1987) points out that, in Ouro Preto, from the middle of the 20th century, all the attention of the Iphan turned entirely to the buildings' facades. The architect explains that this decision aimed to promote a traditional image for the city, but also reflected the Institute's understanding that this would be the best way to maintain a conservative, aesthetic, and stylistic criterion in the listed buildings. Thus, white became indispensable for the masonry, which until then could be painted in shades described as "light," while the wooden elements had to be painted in colors classified as "dark" (Motta, 1987, p. 115).

In Paraty, Pessôa (2011), in one of his articles on the city, points out that, from the 19th century, many architectural surfaces of the historic center began to be colored, reflecting the predominant styles during the First and Second Empire in Brazil. Brazilian eclecticism was on the rise, and technological advances made it possible to manufacture paints in a greater variety of colors. At the beginning of the 20th century, Brazilian architecture underwent significant transformations, and buildings that have maintained their original typologies often adopted colors beyond the white of lime

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Figura 1. a, b – Historic center of Ouro Preto. Photographs of facades recorded during a visit in 2015, evidencing the predominance of white in the masonry and the diversity of colored tones in the architectural elements. Source: Author's Collection, 2015.

Figura 2. a, b – Historic center of Paraty. Photographs that highlight the predominant use of white in masonry, in contrast to the colorful tones applied to the architectural elements of the houses' facades. Source: Author's collection, 2019.

and the shades of ochres, reds, and greens, traditionally used on doors and windows from organic pigments. However, it is important to emphasize that the tones and saturation of colors introduced in Brazilian architecture in the transition from the 19th to the 20th century were softer and distinct from the appearance of contemporary paints, which tend to be brighter and smoother in texture.

In Salvador, the situation was different because, especially in the 1990s, the Iphan sought to consolidate a more colorful image for the city, consistent with its predominantly eclectic architecture. As a result, a chromatic pattern is observed in the historic center where white elements contrast with colored backgrounds, which vary between more saturated tones and paler tones, maintaining a significant chromatic diversity, especially in the townhouses.

In all three cases, the colors of the buildings have been completely renewed over the past decades by the Iphan, as shown by the opinions issued by the agency in the last five years (Florenzano, 2023). These

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Figura 3. a, b – Salvador historic center. Photographs that highlight the colorful tones of the masonry, in contrast to the white architectural elements on the facades. Source: Author's collection, 2024.

documents show a more permissive approach to changes in the facades' substrate and pictorial layer, which contrasts with the principles defended by critical restoration theorists. Given this scenario, the three urban centers reach contemporaneity with the following chromatic configuration in their architectural surfaces (Figure 1, Figure 2, and Figure 3).

Despite this scenario, there is room for pioneering initiatives that advocate another look at architectural surfaces, such as The Cassina Innovation House project, carried out by Laurent Troos in Manaus (AM). In this intervention, the treatment given to the architectural surface follows a historical-critical approach in which the heterogeneous materiality of the mortar and the marks of time prevail. The project shows the coherence between the architectural typology, the passage of time, and the constructed image. In addition, it proposes a new reflection on the past,

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Figura 4. a, b – Cassina Innovation House, Laurent Troost Architectures. Source: available at: https://www.archdaily.com.br/br/958210/casarao-da-inovacao-cassina-laurent-troost-architectures, accessed 18-Aug 2023, 11 am.

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Figura 5. Rehabilitation of Chamboirat House, COVE Architects office. Source: available at: https://www.archdaily.com.br/br/1023190/casa-chamboirat-cove-architectes?ad_source=search&ad_medium=projects_tab, accessed 18 June 24.

presenting an architecture that establishes a distinct relationship with the natural aging of buildings and highlights the connections between historical values and the visual identity of the built heritage. Although it was conceived on the scale of a single building, this model offers favorable conditions for developing similar proposals in listed urban centers. The recognition of the prize-winning**6** and widely accepted project demonstrates that, although this practice is not yet common in the country, both the civil community and experts in the field agree with the image it represents (Figure 4).

However, it is relevant to highlight interventions carried out in other countries, where the treatment of architectural surfaces also follows a historical-critical approach. Figure 5 shows the rehabilitation of a historic building in Ébreuil, France, designed by COVE Architects. Built in the 19th century as an agricultural building, the structure preserves its architectural remnants in the restoration. The masonry of the facades was kept with a patina of time, presenting overlapping layers and gaps in the areas where material was lost.

6 Oscar Niemeyer Award for Latin American Architecture, 2022.

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Figure 6 a, b – Colonia do Sacramento. Source: Author's collection, 2019.

Another example (Figure 6), although not resulting from a specific intervention project, shows individual treatments applied to buildings located in Colonia del Sacramento, Uruguay. With a historic center protected by legislation and intensely explored by tourism, local buildings have coatings that preserve the signs of the passage of time, reflecting a distinct approach to polychrome – where it is not sought to rejuvenate the built heritage through colors. It is worth mentioning that this practice does not imply neglecting pathological manifestations, as the coatings appear to be intact, and the buildings are still in use.

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CONCLUSIONS

Given the above, there is a distance between the recommendations of critical restoration theorists and the practices adopted in Brazil regarding the choice of colors for the facades of historical buildings. In the theoretical path, there is a consensus about the irreversibility of time and the need for coherence between image and architectural typology. However, chromatic interventions that try to forge a past prevail in Brazil, creating an artificial image of historical architecture without considering the passage of time. This process, by itself, is already problematic. However, it becomes even more serious as it is conducted by the National Preservation Agency, supported by a discourse that claims coherence with the theory – a reality we demonstrate here - is not confirmed.

In this context, the design of the Nova Cassina House reveals a complex approach that differs substantially from historicist postmodernism, as it does not use the past in an allegorical or nostalgic way. Notably, it is not a question of fixing a rigid model in the sense of the architectural archetype, but of understanding that, although subject to the action of time, materialities can also seek the maintenance of visual and cognitive elements that dialogue with history and the space in which they are inserted.

The other projects analyzed in this article also refuse the aestheticization of forced rejuvenation by choosing to preserve the marks of time on their facades. This choice can be interpreted as an analogy to what Foster (2021) identifies as an art that combats farce. Together, these examples configure good practices that can inspire and stimulate more judicious interventions in Brazilian architectural heritage.

The required reflection is that the answer lies in the image when practice distances itself from theory. Whether in the architecture of the image, which seeks to represent heritage allegorically, or in the solution itself: remember that the image of the listed good, as emphasized by Brandi (2008), is the aspect that culminates in the recognition of the work of art. Thus, this image must remain in dialogue with the historical instance, and color, as a fundamental element of this composition, must accompany it. For this possible scenario to become a reality, continuing debating and building theory is essential.

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BIBLIOGRAPHY

Aguiar, J. (2002). *Cor e Cidade Histórica: Estudos cromáticos e conservação do patrimônio*. Faculdade de Arquitectura da Universidade Porto publicações [FAUP], Lisboa.

ArchDaily. (2020). Casa de Innovación Cassina / Laurent Troost Architectures. Fotografias de Joana França, Laurent Troost, Alex Pazuelo, Brasil. https://www.archdaily.com.br/br/958210/casarao-da-inovacao-cassina-laurent-troost-architectures

ArchDaily. (2024). Casa Chamboirat / COVE Architectes. Fotografias de Charles Bouchaïb, Olivier Sabatier, Brasil. https://www.archdaily.com.br/br/1023190/casa-chamboirat-cove-architectes

Barry, L. (2008). *What it is*. Drawn & Quarterly, Canadá.

Brandi, C. (2008). *Teoria da restauração*. Ateliê Editorial. Tradução Beatriz Mugayar Kühl. 3. ed. Cotia, SP.

Brandi, C. (2009). *Il restauro: teoria e pratica*. Editori Riuniti., Roma.

Bonelli, R. (1988). Restauro: l'immagine architettonica fra teoria e prassi. *Storia architettura*, 11, 55-14.

Carbonara, G. (1997). *Awicinamento al restauro*. Liguori. Napoli.

Carbonara, G. (2020). Il tema del colore in architettura con una riflessione sul caso del Quartiere Coppedé in Roma. *Magazine recupero e conservazione, 158,* 10–19. https://www.recmagazine.it/sites/default/files/recmagazine158_carbonara.pdf

Florenzano, L. (2023). *As cores das superfícies arquitetônicas no patrimônio urbano uma relação entre a imagem, as normativas de preservação e os princípios teóricos do restauro crítico* [Tese de doutoramento não publicada]. Universidade Federal do Rio de Janeiro.

Foster, H. (2021). *O que vem depois da farsa?* Ubu Editora. São Paulo.

Kühl, B. M. (2004). O tratamento das superfícies arquitetônicas como problema teórico da restauração. *Anais Do Museu Paulista: História E Cultura Material, 12*(1), 309-330. https://doi.org/10.1590/S0101-47142004000100021

Montaner, J. M. (2022). *Arquitetura e Crítica*. Olhares. Barcelona.

AS / Vol 43 / Nº 67 / 2025
ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Mora, P., y Mora, L. (1984). *Le Superfici Architettoniche, Materiale e Colore* in Bureca, A., and Palandri, G., (Eds.). Intonaci colore e coloriture nell'edilizia storica. Atti del Convegno, 25-27 October 1984, Bollettino d'Arte, 6(numerous special) pp. 17-24, Istituto Poligrafico dello Stato, Roma.

Motta, L. (1987). *A Sphan em Ouro Preto, uma história de conceitos e critérios. Revista do Patrimônio Histórico e Artístico Nacional*, (22), 108-122. https://docvirt.com/docreader.net/DocReader.aspx?bib=reviphan&pagfis=8015

Motta, L. (2008). *Patrimônio urbano e memória social – uma avaliação sobre o descompasso entre discursos e ações de preservação* in Correia, M. R. (Org.). Oficina de Estudos da Preservação - Coletânea I. 1ed. Rio de Janeiro: IPHAN-Rio.

Muratore, O. (2010). *Il colore dell architettura storica. Un tema de restauro.* Alinea Editrice. Roma.

Nesbitt, K. (Org.) (2008). *Uma nova agenda para arquitetura*. Antologia Teórica (1965-1995). Coleção Face Norte, volume 10. Cosac Naify, São Paulo.

Pallasmaa, J. (2013). *A imagem corporificada: Imaginação e Imaginário na Arquitetura*. Bookman Editora. Porto Alegre.

Pessôa, J. S. de B.(2011). *O aprendizado sobre as técnicas construtivas coloniais nas primeiras restaurações do SPHAN* [Seminário]. *História da Construção Luso-Brasileira.* Brasil.

Philippot, P. (1966). *La notion de patine et le nettoyage des peintures*. Bulletin de l'Institut Royale du Patrimoine Artistique, Bruxelles, 9, p. 138-143. https://difusion.ulb.ac.be/vufind/Record/ULB-DIPOT:oai:dipot.ulb.ac.be:2013/238777/Holdings

Santopuoli, N. (2015). Il rilievo del colore per il restauro delle superfici architettoniche. *DisegnareCon, 8*(14), 11.1-11.10. https://disegnarecon.univaq.it/ojs/index.php/disegnarecon/article/view/21/16

Turco, M. G. (10-11 novembre 2018). *Coloriture architettoniche: questioni aperte, Restauro e Architettura. Problemi di tutela e conservazione* [Sessione della conferenza]. Vuolsi aiutare quel ch'è fatto, e non guastare quello che s'abbia a fare. Atti del V Seminario di formazione per gli insegnanti, Musei Vaticani, Anisa per l'educazione, Roma, Italy.

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DOCUMENTING REPUBLICAN ARCHITECTURE IN AREQUIPA. SPATIAL, CONSTRUCTIVE, AND STYLISTIC ASSESSMENT OF THREE EMBLEMATIC "CASONAS"

DOCUMENTANDO LA ARQUITECTURA REPUBLICANA DE AREQUIPA. VALORACIÓN ESPACIAL, CONSTRUCTIVA Y ESTILÍSTICA DE TRES CASONAS EMBLEMATICAS

DOCUMENTANDO A ARQUITETURA REPUBLICANA EM AREQUIPA. AVALIAÇÃO ESPACIAL, CONSTRUTIVA E ESTILÍSTICA DE TRÊS "CASONAS" EMBLEMÁTICAS

Figura 0. Inventario fotográfico obtenido Alianza Francesa. Fuente: Elaboración de los autores.

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RESUMEN

Más del 50% de las edificaciones que conforman la zona monumental de Arequipa, Perú, pertenecen al período republicano. Cerca de 500 edificios, en su mayoría de arquitectura doméstica -por lo que reciben el nombre genérico de "casonas", presentan fachadas que pueden ser catalogadas dentro de los estilos neoclásico, neorrenacentista, ecléctico, neogótico, art decó y art Nouveau. De éstos, 240 cuentan con declaración como Patrimonio Cultural, lo que deja cerca del 50% de edificios desprotegidos y por tanto expuestos a mayores riesgos de ser abandonados, deteriorados o alterados con intervenciones que afecten su fábrica original. Ante esta realidad, la presente investigación busca interpretar los procesos de evolución espacial, constructiva y estilística de edificaciones significativas de este período, como aporte a su conocimiento y preservación. La investigación aplicó una metodología para clasificar, seleccionar, evaluar y analizar las principales características de tres casonas que actualmente albergan las instituciones Alianza Francesa de Arequipa, Centro de la Artes de la Universidad Católica San Pablo y Colegio de Arquitectos del Perú Regional Arequipa, todas ellas muestras significativas de arquitectura del período republicano que han adaptado sus espacios a nuevos usos. Estas casonas fueron seleccionadas a partir de la calificación de una muestra mayor. Del análisis realizado se desprendieron resultados que evidencian aspectos como el porcentaje de conservación de la fábrica original de los edificios, que en todos los casos es superior al 50%, o la proporción de espacio abierto, que en algunos casos se ha visto reducido hasta ocupar el 20% del lote. A nivel constructivo, se destaca la preservación de estructuras de sillería de ignimbrita con muros de cajón, cubiertas con bóvedas de cañón en dos de los casos estudiados y cubiertas planas con rieles de hierro en uno de ellos, contabilizándose adiciones estructurales con materiales contemporáneos de hasta un 30%. Respecto a las cualidades estilísticas, se han identificado los principales rasgos compositivos que les asignan un valor de estilo, siendo el lenguaje neoclásico el predominante.

Palabras clave: patrimonio, evolución espacial, evolución constructiva, estilo arquitectónico, fotogrametría.

ABSTRACT

More than 50% of the buildings in the monumental area of Arequipa are from the Republican period. Close to 500 buildings, primarily domestic architecture -hence they are commonly referred to as "casonas" (big houses)- have facades that can be classified within the neoclassical, neo-Renaissance, eclectic, neo-Gothic, Art Deco, and Art Nouveau styles. Of these, 240 have been declared as Cultural Heritage. Given this reality, this research seeks to interpret the spatial, constructive, and stylistic evolution processes of significant buildings from this period to contribute to their understanding and preservation. The research has applied a methodology to classify, select, evaluate, and analyze the main characteristics of three "casonas" that currently house the Alliance Française of Arequipa, Center for the Arts of the Catholic University San Pablo, and the Arequipa Regional College of Architects of Peru, all of them significant examples of Republican period architecture that have adapted their spaces to new uses, and which were chosen based on the qualification of a larger sample. The analysis results show aspects such as the preservation percentage of the building's original fabric, above 50% in all cases, and the proportion of open space. At a constructive level, the preservation of ignimbrite ashlar structures with box walls stands out, covered with barrel vaults in two of the cases studied, and flat roofs with iron rails in one of them, with structural additions where contemporary materials comprise up to 30%. Regarding stylistic qualities, the main compositional features that assign them a stylistic value have been identified, with neoclassical language predominating.

Keywords: heritage, spatial evolution, constructive evolution, architectural style, photogrammetry.

RESUMO

Mais de 50% dos edifícios que compõem a área monumental de Arequipa, Peru, pertencem ao período republicano. Cerca de 500 edifícios, em sua maioria de arquitetura doméstica - razão pela qual recebem o nome genérico de "casonas" - possuem fachadas que podem ser catalogadas dentro dos estilos neoclássico, neorrenascentista, eclético, neogótico, art déco e art nouveau. Desses, 240 foram tombados como Patrimônio Cultural, o que deixa cerca de 50% dos edifícios desprotegidos e, portanto, expostos a maiores riscos de serem abandonados, deteriorados ou alterados com intervenções que afetem seu tecido original. Diante dessa realidade, a presente pesquisa busca interpretar os processos de evolução espacial, construtiva e estilística de edifícios significativos desse período, como uma contribuição para seu conhecimento e preservação. A pesquisa aplicou uma metodologia para classificar, selecionar, avaliar e analisar as principais características de três grandes casarões que atualmente abrigam as instituições Alianza Francesa de Arequipa, Centro de la Artes de la Universidad Católica San Pablo e Colegio de Arquitectos del Perú Regional Arequipa, todos eles exemplos significativos da arquitetura do período republicano que adaptaram seus espaços a novos usos. Estas mansões foram selecionadas com base na qualificação de uma amostra maior. A partir da análise realizada, foram obtidos resultados que mostram aspectos como o percentual de conservação do tecido original dos edifícios, que em todos os casos é superior a 50%, ou a proporção de espaço aberto, que em alguns casos foi reduzida até ocupar 20% do lote. Em termos de construção, a preservação das estruturas de cantaria de ignimbrito com paredes de caixa, telhados em abóbada de berço em dois dos casos estudados e coberturas planas com trilhos de ferro em um deles, sendo que os acréscimos estruturais com materiais contemporâneos representam até 30%. Com relação às qualidades estilísticas, foram identificadas as principais características compositivas que lhes atribuem valor estilístico, sendo a linguagem neoclássica a predominante.

Palavras-chave: patrimônio, evolução espacial, evolução construtiva, estilo arquitetônico, fotogrametria.

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INTRODUCTION

In the historic urban center of Arequipa, Peru, specifically the foundational checkerboard, 5.93% of buildings are from the Viceregal period, 48.53% from the Republican period (19th and early 20th centuries), 20.84% from the modern period, and 24.70%, the contemporary period (Arequipa Municipal Planning Institute [IMPLA], 2017). This means that about half of the buildings in the monumental area are from the Republican period. However, they have retained the unity of an urban ensemble, where certain values were recognized, meriting the Historic Center of Arequipa's declaration in 2000 as a Cultural Heritage of Humanity by the United Nations Educational, Scientific, and Cultural Organization [UNESCO].

The need to understand Historical Centers from their integrality, expanding the view on cultural heritage, implies no longer restricting the conservation of heritage to the preservation of certain monuments but instead including the different ensembles of properties that, regardless of their origin, era or architecture, are representative of the memory of increasingly culturally diverse societies. It is also essential to understand Historical Centers not as a static and immovable entity but as an integral part of growing cities, with the same dynamics and potentialities in the social, economic, cultural, and/or environmental aspects as any other part of them. In this, the buildings of protected areas play an important role in how they can be adapted to new uses under social changes, without this meaning that their heritage status is lost, determined by the prevalence of specific values of memory or identity.

This article seeks to direct the gaze toward specific architectural facts of Arequipa's central area. The buildings from the Republican period represent a relevant proportion of the urban complex since there are approximately 500 buildings, mostly of domestic architecture, with a predominance of neoclassical, neo-Renaissance, eclectic, neo-Gothic, Art Deco and Art Nouveau architectural styles, which are generically called "***casonas"*** or mansions. Of these, less than 240 have been declared cultural heritage, and another 187 have been proposed to be declared as such (IMPLA, 2017). The buildings that are not declared as monuments are exposed to being abandoned by interventions that partially or entirely alter their conformation or, in the worst case, are at risk of destruction, either due to seismic causes or intentionally due to the commercial pressure on the urban area in which they are located.

Protecting and safeguarding heritage as the foundation of society's identity requires adequate knowledge as a precondition. In Peru, the responsibility for disseminating the values that attach

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importance to heritage initially lies with the Ministry of Culture, a Central Government entity whose roles expressly include "[...] carrying out actions for the conservation and protection of cultural heritage [...], and promoting the strengthening of citizenship and cultural identity [...]" (Ministry of Culture [MINCUL], n.d.). Other international specialized agencies such as UNESCO and ICOMOS have also been involved in protecting cities' material heritage without neglecting the role of local governments. However, the citizens themselves are called to actively participate in the initiatives to disseminate the identity values of their monuments. Local actors, individually or as organized groups, can intervene in managing heritage from the opinion, mobilization, dissemination, awareness, and fundamentally, the use and benefit of cultural property.

That is why this research contributes to recognizing the values of certain architectural expressions of the past of Arequipa, understanding that it is necessary to understand what you want to preserve. This article outlines the methodology used to select three buildings of the Historical Center of Arequipa, to carry out a review of architectural elements that complement the existing documentation, and to carry out an analysis of spatial, constructive, and stylistic values, which point to the documentation and knowledge that allows including the buildings of the Republican period of Arequipa's monumental area to the city's body of the intangible cultural heritage, to the same degree as the exponents of the architecture of other historical periods.

The methodology for documenting the architecture analyzed is primarily based on using photogrammetry as a collection method. This method explores the advantages and possibilities for documenting real estate heritage. Its speed and accuracy were tested, which were very useful for reviewing facades.

STATE-OF-THE-ART

The use of digital photogrammetric techniques has become widespread over the last decade in diverse civil and academic fields. In the case of architecture in general and the preservation of real estate heritage in particular, the current use of the technique allows surveys to be carried out quickly and accurately using the multi-image system, becoming an extremely useful tool for heritage conservation work. Photogrammetry is based on the principle that it is possible to recreate the shape and dimensions of an object using its photographs, i.e., that a photograph can provide analytical data over a simple description. Simply, if a photograph is a conical perspective of an object generated from a certain point of view, the reverse allows one to deduce the shape of said object from the corresponding photograph (Natividad Vivó & Calvo López, 2010).

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To do this, it is necessary to identify the coordinates of a point in two or more photographs of a particular object and superimpose them. Although the technique has been used since 1858 to survey architectural works, analog photogrammetry was not used on a large scale as it required complex methods to establish correlations between different photographs and mathematical algorithms to reconstruct the shape of buildings. The advent of digital cameras and computer development simplified the procedure. At the start of the century, researchers were already talking about the possibilities the mechanism had with the level of technological development of the time (Almagro, 2000). However, the problem of the high cost of the equipment needed for data processing persisted for some time. Nowadays, the improvement and use of specialized software allow surveys to be carried out with exceptional graphic quality and high precision at low cost, and with the additional advantage of enabling early detection of errors in the model and their simple correction (Moyano, 2017).

In the case of the research in this article, digital photogrammetry is proposed to facilitate the survey and analysis of architecture that is part of the cultural heritage of the Republican period buildings in Arequipa, thereby contributing to their preservation. The research is not directed towards the city's main monuments of civil and religious architecture, but to those that until now have been relegated as an object of academic rigor and that are included within a broader concept of heritage, demanding a particular response to face the risk of deterioration to which they are exposed (Almagro, 2000). Several research studies have used photogrammetry as a tool for heritage conservation, from the urban analysis of historical centers supported by aerial photogrammetry (Picon-Cabrera et al., 2021) to reconstructions of architectural elements that, due to their level of complexity, would be unfeasible to build traditionally, such as the reproduction of each of the stonework pieces of a vault edge comprising whole pieces (Natividad-Vivó & Calvo-López, 2010), through the survey of the state of conservation of walls in industrial heritage (Villar, 2018), or proposals for the mapping of pathologies in heritage elements (Sánchez López, 2021).

In the case of Arequipa, photogrammetry, as an instrument for preserving heritage, has been used in the civil sphere by surveying several buildings. However, few scientific research studies have been made. The case of virtualization of the archaeological site of Toro Muerto can be cited (Gonzales Ruiz et al., 2020) or the long-awaited project to reconstruct the face of the "mummy" Juanita using digital photogrammetric techniques by researcher Andrew Wilson, announced in 2018 by the Andean Sanctuaries Museum of the Santa María Catholic University. As for the

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architectural heritage of Arequipa, it awaits the opportunity to be studied using this technique.

This research seeks to approach this heritage considering the current conservation paradigms, which highlight the transcendental relationship between heritage and identity, reforming the ideas of heritage protection of the 20th century. After the end of the Second World War in 1946, UNESCO emerged as an entity that would protect cultural property as part of its mission. That framework saw the terms "cultural asset" or "cultural heritage" begin to be used. In addition, the drafting in 1964 of the International Charter for the Conservation and Restoration of Monuments and Sites, known as the Venice Charter, which gave rise to the principles of monument preservation that would be taken into account from then on, is a noteworthy event. Today, however, it is clear that, as Arévalo summed up well (2004, p.931), cultural heritage must be protected "[...] not so much for its aesthetic and ancient values, as for what it means and represents."

These notions are relevant to the case of Arequipa. This city has a rich, immovable cultural heritage, mainly constituted by its architectural urban ensemble originating in the 16th and 17th centuries but also integrated by the architecture of later periods, which nevertheless follow the line of Western tradition. This monumental heritage led in 2000 to the Historic Center being recognized by UNESCO as a Cultural Heritage of Humanity, among other considerations on composing an "[...] exceptional example of colonial settlement, challenged by natural conditions, indigenous influences, the process of conquest and evangelization, as well as the spectacular nature of its surroundings" (UNESCO, 2000).

The cyclical occurrence of seismic movements has meant that the historic center has been subjected to continuous reconstruction processes, whereby the pre-eminence of architectural styles has been modified. This is especially noticeable after the earthquake of 1784, after which neoclassicism would begin to impose itself (Zúñiga Alfaro, 2015), and that of 1868, from which the neoclassical was consolidated, with the neo-Renaissance appearing a few years later.

Thus, most of the buildings in the city's central area belong to this historical period, exhibiting mainly the neoclassical style but also other styles that followed later in the city (neo-Renaissance, eclectic, neo-Gothic, art deco, art nouveau) during the 19th and the first half of the 20th century, until the advent of modern architecture, which makes its appearance in Arequipa after the

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earthquakes of 1958 and 1960. Moreover, they are essentially typologies of domestic architecture, which demand attention that has not been given to them so far, making clear the difference between the knowledge one has of them versus those of religious typology and the Viceregal period.

Despite the importance of these buildings as part of Arequipa heritage, the study of their architectural styles has been limited compared to their less numerous peers of the Viceregal period (the most outstanding exception being the Goyeneche house, restored by the Central Reserve Bank of Peru in 1970). This research addresses this issue comprehensively, analyzing the spatial, constructive, and stylistic evolution of Republican period buildings between 1821 and the first decades of the 20th century to conserve the city's cultural heritage.

METHODOLOGY

MATERIALS

The research methodology proposed a preliminary evaluation of buildings to determine how many and which ones would be considered in the study. Then, the selected buildings were diagnosed and cataloged according to their architectural style and construction period. Fieldwork surveyed the facades of the buildings with photographs using a Canon EOS Rebel SL3 camera with an EF-S 18-55mm IS STM lens. Work was then done to survey the buildings' facades and floors with the specialized 2D ***Autodesk AutoCAD*** software in its 2023 version (English) and 3D ***Agisoft Metashape Pro***. With the 2D and 3D data, spatial analysis of the buildings was made, and their stylistic character and constructive conditions were analyzed. Evaluation forms were then prepared considering their main spatial, constructive, and stylistic qualities to design and apply a comparative matrix between the buildings to recognize patterns, coincidences, dominant elements, and architectural value by their originality. Conclusions and final reflections were drawn from the data obtained.

Cataloguing and selection of case studies

To pre-select the buildings, residential civil buildings were considered whose outside facades were from the Republican era, from 1821 to the first decades of the 20th century, for those in an adequate state of conservation and with public use. Their spatial, constructive, and stylistic characteristics were also considered.

The cataloging and diagnosis of the pre-selected buildings consisted of applying a standard form where the following scoring criteria were established:

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Physical characteristics of the building: Comprising the identification of stylistic elements (entrances, tympanums, anagrams, cornices, entablatures, friezes, triglyphs, metopes, capitals, astragalus, pilasters, basements, pedestals, baseboards, corbels, keystones, cushions, listels, straight lintels, curved lintels, epigraphs, balustrades, balconies, etc.), spatial elements (hallways, courtyards, covered galleries, exterior staircases, etc.) and constructive elements (vaulted ceilings, plate roofs, concrete roofs, etc.) they have.

Use/Disuse: This refers to how the evaluated buildings are currently used.

Structural features: These evaluate the structural conditions of the infrastructure in terms of the type of structure used and its current state.

State of conservation: This measures the level of conservation of the building facilities and is divided into indoor and outdoor upkeep.

Living conditions index: This considers the variables related to building comfort, social impact, safety and use, and the availability of public spaces.

Academic criteria: These consider the following values: artistic (aesthetic), instrumental (functionality), and historical (historical relevance).

After quantifying the results for each criterion, a total was calculated, scoring them from 0 to 100. The buildings chosen had more than 70 points.

The shortlisted buildings were as follows:

- La Merced 112 corner with Palacio Viejo, today, a banking agency
- La Merced 110, today, Museo Santuarios Andinos UCSM
- Consuelo 116, today, Hotel Casona del Solar
- Palacio Viejo 414, today, UCSP Arts Center
- Santa Catalina 210, corner with Ugarte, today, commercial and restaurant premises
- Santa Catalina 208, today, Alianza Francesa of Arequipa
- Santa Catalina 306 (private house)
- Santa Catalina 410, corner of Puente Grau, today, Caritas Diocesana Arequipa
- Bolívar 204, the former home of the newspaper, Correo
- Bolívar 207, today, the Arequipa Regional Office for the College of Architects of Perú
- Ugarte 207, the German Peruvian Cultural Institute
- Zela 216, today, commercial and restaurant premises

It should be noted that all the buildings measured have undergone varying degrees of alterations, maintaining, however, specific original characteristics, a criterion that has affected the assigned rating.

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	Building	A. Physical			B. Use/ des.	C. Str. Feat	D. State of conserv.		E. Living conditions index				F. Academic criteria			Total
		Stylistic elements	Spatial elements	Constructive elements			External upkeep	Internal upkeep	Comfort of the building	Social impact	Security and use	Availability of public space	Artistic values	Instrumental value	Historical values	
		15	15	15	7	5	4	4	5	5	5	5	5	5	5	100
1	La Merced 112	8	10	10	5	3	3	2	4	2	4	3	4	4	2	64
2	La Merced 110	8	10	10	7	3	3	3	3	5	4	3	4	5	2	70
3	Consuelo 116	8	10	10	5	3	3	2	4	3	3	3	4	4	2	64
4	Palacio Viejo 414	10	10	12	7	3	3	3	4	5	4	3	4	5	2	75
5	Santa Catalina 210	10	10	10	5	3	3	3	4	3	5	3	4	4	2	69
6	Santa Catalina 208	12	10	12	7	3	3	3	4	5	5	3	4	5	2	78
7	Santa Catalina 306	8	10	10	7	3	2	2	3	2	4	1	4	2	2	60
8	Santa Catalina 410	10	10	10	5	2	2	2	3	4	3	3	4	5	2	65
9	Bolívar 204	8	10	10	5	2	2	2	3	3	3	3	4	3	2	60
10	Bolívar 207	8	10	12	6	3	3	3	4	5	4	3	4	4	2	71
11	Ugarte 207	8	10	10	7	3	3	3	4	4	4	3	4	4	2	69
12	Zela 216	8	10	10	5	2	3	2	3	3	4	3	4	4	2	63

Table 1. Standard sheet with the selection criteria. Source: Preparation by the authors

After the first diagnosis, it was determined that three buildings achieved a score above 70. Thus, the following case studies were chosen:

Case study 1: Santa Catalina 208 / Alianza Francesa de Arequipa, with a score of 78

Case study 2: Palacio Viejo 414 / UCSP Arts Center with a score of 75

Case study 3: Bolívar 207 / Arequipa Regional Office – College of Architects of Perú, with a score of 71

2D and 3D survey of case studies

Field visits were conducted to the case studies on July 28th, 29th, and 30th, 2023, to survey the buildings. To do this, 2D plans were reviewed using the AutoCAD software based on previous documentation obtained and on-site corroboration. The case studies considered the solar incidence to define the photogrammetric survey schedules. It was prioritized that the sun did not generate shadows projected on the facades, determining the schedules of 7:00 am, 1:00 pm, and 5:00 pm as appropriate.

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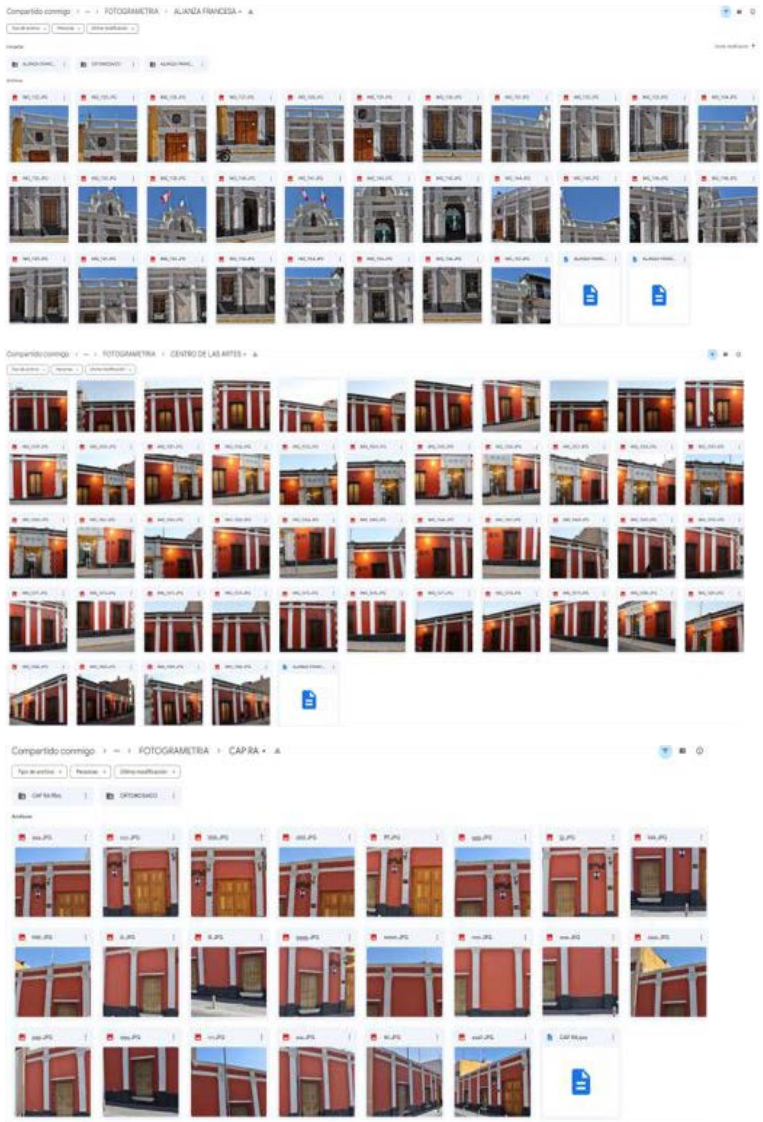

(a)

(b)

(c)

Figure 1. Photographic inventory obtained for the photogrammetric processing of the case studies. (a) Alianza Francesa (b) UCSP Arts Center (c) College of Architects CAP-RA. Source: Preparation by the authors.

The photographic survey consisted of taking data from sequenced photographs of the exterior and interior facades of the building. The photographic survey shots were taken using mass data capture techniques with a Canon DS126761 Professional Camera -and tripod. The image survey process was conducted on the exteriors of the houses based on close-up object shots.

The graphic data was processed in the Metashape software from Agisoft, where the images are integrated to achieve point clouds that are concatenated to form polygons that result in a three-dimensional model. By applying this technique, it is possible to conserve the original details. One hundred photographs were taken at 7:00 am for CAP-RA, 1:00 pm for Alianza Francesa, and 5:00 pm for the UCSP Arts Center. An average of 30 photos per building were documented, with an image capture period of 10 to 15 minutes per facade. The images obtained constituted a reference catalog for the subsequent

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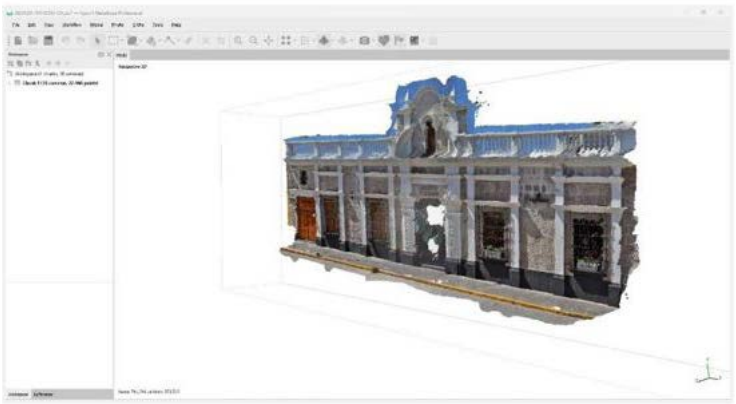
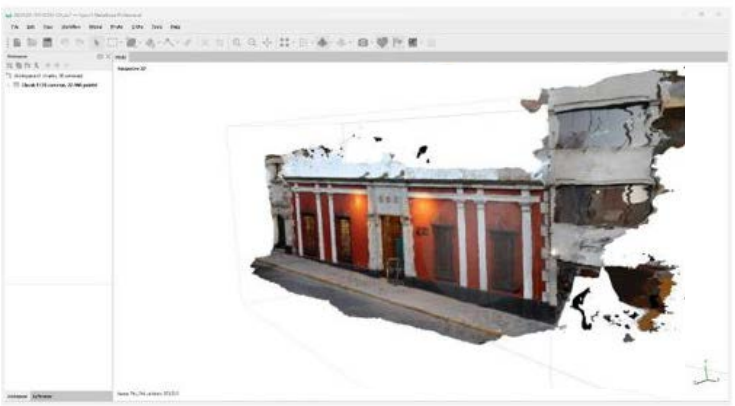
Figure 2. 3D models obtained from the photogrammetric survey. (a) Alianza Francesa (b) UCSP Arts Center (c) College of Architects CAP-RA. Source: Preparation by the authors.

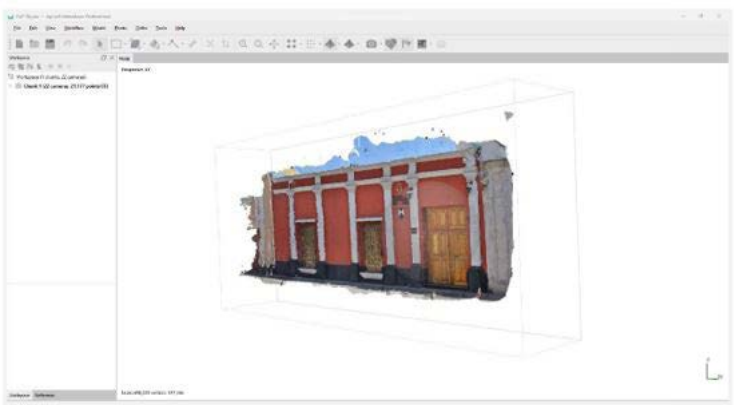
(a)



(b)



(c)



analysis and processing of information for the diagnosis to be performed. The 2D and 3D models allowed comparison of the case studies' spatial, constructive, and stylistic evolution data.

A 2D redrawing was made in AutoCAD using the orthophotos obtained, obtaining accurate and detailed elevations of the case studies' main facades. This result was an invaluable tool for the comparative analysis of the main formal components.

Plans were also made in AutoCAD 2D to analyze the spatial qualities of the case studies. It should be noted that the ground

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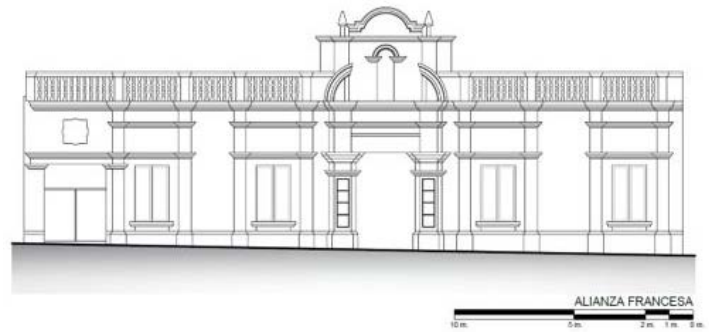
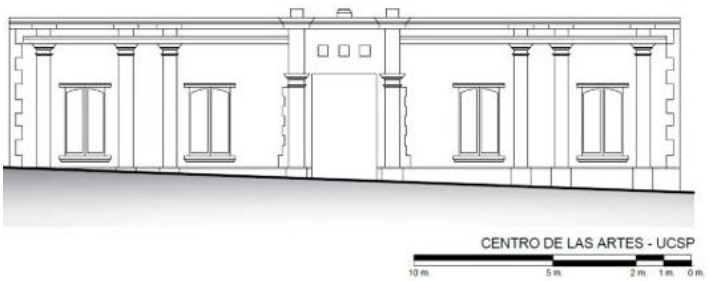


(a)



(b)

(c)

Figure 3. Redrawing the facades of the case studies. (a) Alianza Francesa (b) UCSP Arts Center (c) College of Architects CAP-RA. Source: Preparation by the authors.

floor was used for Alianza Francesa because it was the most representative of the period studied; the UCSP Arts Center and the College of Architects have only one floor.

A comparative analysis of the case studies was conducted at spatial, constructive, and stylistic levels with the information obtained. At a spatial level, a comparison was made of the floor plans of the selected buildings: the built and open circulations, recurrence of courtyards and areas of bigger and smaller rooms, and the building's general morphology at a volumetric level were compared. At a constructive level, the original spaces of the conditioned and newly fabricated areas were distinguished; it was considered that, in all cases, the buildings had varied their original use of housing. The wall covering, walls, and roofs were also evaluated. At a stylistic level, the comparative analysis of the facades was made for walls, compositional elements, building details, entrance, modifications, and finishing.

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RESULTS

Spatial analysis

The spatial conditions of the ***casonas*** were evaluated based on the characteristics of their main architectural components, and quantitative and qualitative data were considered to understand how the buildings have adapted to new requirements in terms of uses and users. The spatial relationships between components also determined the extent to which spatial adaptations have been required for the roles they currently perform. It was also verified that the spatial evolution of the architecture has conditioned its shape, which is directly related to the degree of alteration presented by each case study. The following spatial analysis parameters were used for this research:

- Surfaces of larger and smaller rooms
- Circulations
- Built and open
- General morphology of the building at a volumetric level
- Recurrence of courtyards

The comparative matrix highlights that the largest spaces are between 70 m^2 and 80 m^2 and are used mainly as auditoriums or multipurpose halls. The smallest rooms are between 30 m^2 and 36 m^2, with the priority use being for offices. As for the circulations, the recurrence of courtyards connected by slopes is evident, with a hallway as the primary access to the houses. This is the typology of a traditional Arequipa courtyard house. The percentage of full or built-up space is between 60% and 80% of the house's total area, which leaves 20% to 40% as empty or free areas, where it should be mentioned that in no case are the open spaces used for vehicle parking. The morphology of the case studies follows the spatial typology of a courtyard house, with Alianza Francesa and the UCSP Arts Center linear, in contrast to the CAPRA College of Architects, which has a grouped morphology. This is due to the addition of land to the initial house. In all cases, the courtyards have been preserved as organizing components of spaces and activities.

Constructive analysis

Regarding the construction systems, it can be mentioned that the evolution in the built heritage of Arequipa can be seen in the Viceregal architecture of the 16th, 17th, and 18th centuries by Castilian architects in principle and product of the mixing of its end. This learning, interpretation, and response condition means the buildings have an "... almost vernacular architecture if it were not for the constant attention to foreign trends that provide some details" (Zúñiga Alfaro, 2022, p.111). The construction system of

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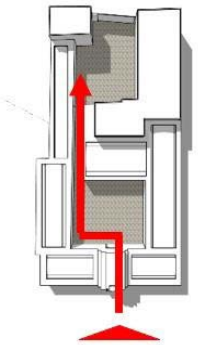
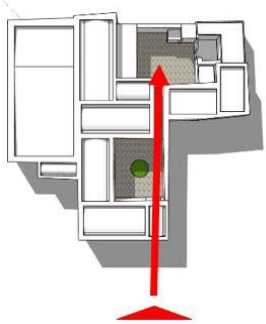
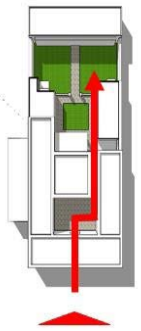
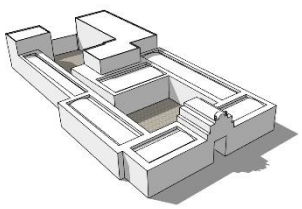
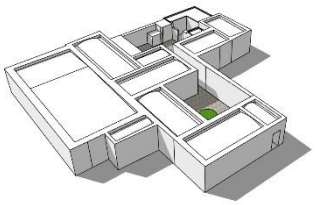
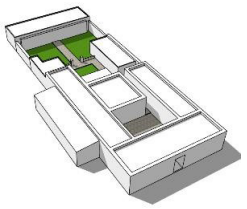
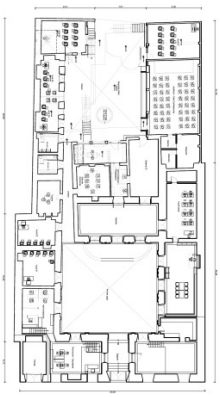
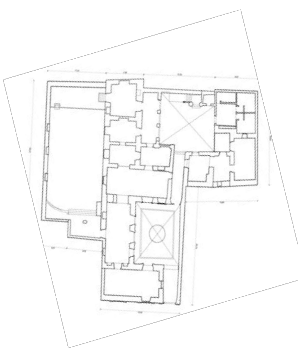
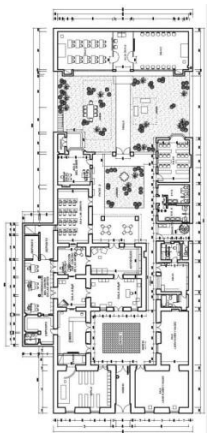
	ALIANZA FRANCESA	COLLEGE OF ARCHITECTS - CA-PRA	UCSP CENTER FOR THE ARTS
Surface areas of smaller and larger rooms Circulations	Largest area: 80.02 m2. Smallest area: 34.05 m2.  Access by hallway to courtyard 1 and slope to patio 2	Largest area: 85.00 m2. Smallest area: 36.00 m2.  Access by hallway to courtyard 1 and slope to courtyard 2	Largest area: 70.13 m2. Smallest area: 30.70 m2.  Access by hallway to courtyard 1 and slope to courtyard 2
Full and empty	% full: 65.50% built % of empty spaces: 34.50% courtyards	% full: 80% built % of empty spaces: 20% courtyards	% full: 60% built % of empty spaces: 40% courtyards
Building's general morphology at a volumetric level	 Volumetry of elongated courtyard house conditioned to rectangular Mediterranean plot	 Standard courtyard house volumetry with additions to the original plot, extensions for services, and auditorium.	 Volumetry of elongated courtyard house with back door, conditioned to rectangular Mediterranean plot
Recurrence of courtyards and relationship with adjoining spaces	 Courtyard 1 has a direct relationship with the entrance hall and adjacent rooms. Courtyard 2 has a direct relationship with vertical spaces and circulations.	 Courtyard 1 has a direct relationship with adjoining spaces and an indirect one with the main auditorium. Courtyard 2 has a direct relationship with service spaces and indirect through colonnades.	 Courtyard 1 maintains a direct relationship with adjoining spaces, an organizational purpose. Courtyard 2 has a direct relationship with functional spaces and gardens and an indirect relationship with the auditorium.

Table 2. Comparative matrix of spatial parameters. Source: Preparation by the authors.

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the Arequipa mansions is mainly solved with a material known locally as ashlar (ignimbrite), later adding brick additions in vaults and floors. Boulder stone is also used for floors and foundations, as lime, sand, and earth are used for wall plaster. Wood is scarce and is used for furniture and carpentry (Burga, 2010).

According to these particularities, the research sought to analyze the main structural components of the case studies. Their original structure, comprising walls and ignimbrite roofs, was valued, and so was their level of conservation, while the original structures of the new extensions were appreciated and differentiated. It should be noted that only the first floors of the case studies were analyzed because they are the ones from the Republican period. The parameters measured were the following:

- Wall construction system
- Roof construction system
- Original rooms
- Recent rooms

	ALIANZA FRANCESA	COLLEGE OF ARCHITECTS - CAPRA	UCSP CENTER FOR THE ARTS
Wall construction system	0.80 to 1.20 m wide ashlar and brick walls It does not have an outer coating	0.90 to 1.20 m wide ashlar and brick walls It has a coating	0.60 to 0.75 m wide ashlar and brick walls It has a coating
Roof construction system	Roof with barrel vaults run in original spaces	Roof with barrel vaults run in original spaces	Flat roofs with plate and ashlar structures in original spaces
Original rooms	80% of the building's structures.	90% of the building's structures.	70% of the building's structures.
Recent rooms	20% of the building's structures.	10% of the building's structures.	30% of the building's structures.

Tabla 3. Comparative matrix of the constructive parameters of the case studies. Source: Preparation by the authors.

From the results obtained, the width of the ashlar walls stands out, which in the case of the houses with barrel vaults is greater than houses with flat plate roofs, obtaining widths between 0.80 m and 1.20 m for the walls with vaulted roofs, and 0.60 m to 0.75 m for the walls with plate roofs. In all cases, coating was found on the interior walls. As for the level of conservation of the house's original structure, it is evident that between 70% and 80% have been preserved, with modifications of 10% to 30% of the total structure. This is due to possible extensions and/or losses due to seismic movements.

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Stylistic analysis

For this analysis, the elevations of the buildings shown by photogrammetry and redrawn in 2D were used, identifying the following components:

- Walls
- Compositional elements
- Building's details
- Entrances
- Modifications
- Finishes

Table 4. Comparative matrix of the case studies' stylistic parameters. Source: Preparation by the authors.

	ALIANZA FRANCESA	COLLEGE OF ARCHITECTS - CAPRA	UCSP ARTS CENTER
Walls	Stone block walls without any type of coating.	Stone block walls with paint finish	Stone block walls with paint finish
	Ashlar and brick walls	Ashlar and brick walls	Ashlar and brick walls
Compositional elements	Has a stone plinth	Has a stone plinth	Has a stone plinth
	8 semi-detached pilasters with their respective simple cornices that mark the façade's 4 windows	5 semi-detached pilasters with continuous cornice flanking 2 window openings, and 1 door opening.	6 semi-detached pilasters with continuous cornice flanking the 4 window openings. The openings near the entrance do not have pilasters.
	Rectangular windows with wooden carpentry and simple iron grilles	2 rectangular windows with wooden carpentry and iron grilles	4 rectangular windows with wooden carpentry and iron grilles with ornaments
Building's details	It has simple bases and pilasters with double cornice that accompany the window openings	It has bases and pilasters with simple double cornice	It has simple bases and pilasters with double cornice that accompany the window openings
	It has a simple double cornice	It has a simple double cornice	It features a simple cornice
Entrance	The façade's entrance has two wide pilasters with details ornamented with texao flowers or similar. Double cornice and with ornament under it.	The entrance is simple, without any ornament or symmetry.	The façade's entrance is unique, with two simple pilasters with capitals flanking it. The frieze is simple, with 3 centered quatrefoils that break the cornice's continuity
	It does not have a cantilever	It does not have a cantilever	It does not have a cantilever
	It has a semicircular upper cornice flanking a thin opening	It has an elongated upper cornice over the entire facade	It has an elongated upper cornice over the entire facade
	The pilasters end in ornamental elements	It has pilasters with finials on capitals that stand out from the upper cornice	It has pilasters with finials on capitals that stand out from the upper cornice
Modifications	An additional opening is identified on the left side as a door, cutting the house's symmetry.	No relevant modifications	No relevant modifications
Finishes	As a finishing touch, some balusters follow the rhythm of the pilasters	N/A	As a finishing touch, there are three ornamental elements.
Style	Neo-renaissance	Neoclassical	Neoclassical

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The comparison between the mansions of Alianza Francesa, the CAPRA College of Architects, and the UCSP Arts Center revealed significant variations in the use of stock block walls, compositional elements, and architectural details, which reflect different and similar aesthetic and functional approaches in their designs.

Alianza Francesa opts for a facade without coating, where the natural texture of the stone block is preserved. It has ornamental and structural compositional elements that are recurrent in the mansions of the Republican era, such as the attached pilasters, simple cornices, rectangular windows with wooden carpentry, and iron grilles. It is evident that the entrance of this house denotes a more elaborate and ornamental design than the others. Including an additional opening modifies the original symmetry, suggesting a functional adaptation.

On the other hand, the College of Architects – CAPRA introduced a paint finish on the stone blocks. The simplification of compositional elements, such as the reduction of the number of pilasters and the presence of a less ornate entrance, suggest an inclination towards functionality and simplicity of its composition.

The UCSP Arts Center also applied paint to the stone blocks, maintaining uniformity with the College of Architects. However, it is distinguished by more pilasters flanking the window openings without pilasters near the entrance and by the inclusion of ornaments in the window's iron grilles. The entrance, while unique, is still relatively simple compared to the Alianza Francesa's, indicating a fusion of tradition and simplicity.

While the Alianza Francesa wants to distinguish itself with its entrance, the CAPRA College of Architects and the UCSP Arts Center seek a balance between tradition and modernity, using color and simplifying elements to adapt to contemporary needs. The diverse approaches reflect the flexibility of stone blocks as a material and their ability to adapt to different architectural expressions.

DISCUSSION

interpretation of the results

The historical architecture of societies forms a hallmark of their identity and constitutes an unquestionable part of the collective memory. Knowing and valuing this heritage are inescapable conditions for its preservation, so it becomes a prevailing need to incorporate the buildings and architectural styles of the Republican period of the monumental area of Arequipa into the city's body of intangible cultural heritage to the same degree as the exponents of the architecture of other historical periods are.

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More than 50% of the buildings from the Historic Center's Republican era are not declared as cultural heritage, exposing them to serious deterioration risks. The importance of these buildings having a particular consideration about their heritage value does not lie in issuing a normative declaration that can be more or less ambiguous, but in the fact that the citizenry recognizes them as such. The citizen's estimation, which in the long run can be translated into the well-known declaration, will protect these constructions from suffering partial or total alterations, abandonment, or even demolition.

Photogrammetric techniques have contributed to documenting the selected buildings. However, certain limitations of the methodology have been revealed. Although photogrammetry has been especially useful for reviewing facades and facilitating the stylistic analysis of the exterior architectural expression, the review of interior spaces is challenging due to the complexity of linking the survey of each space. Given this, the use of laser scanners as a complement to photogrammetry was assessed. Also, it was impossible to complete the survey of the roofs from above, which hindered the possibility of generating complete volumetry models. Hence, drones are recommended for taking aerial photographs.

Notwithstanding this, it is considered that results have been obtained that allow showing the relationships between the spatial, constructive, and stylistic qualities of the analyzed buildings. The documentation obtained expands the existing knowledge about the characteristics of the mansions, knowledge whose dissemination contributes to their assessment by the community and their care and conservation.

From the information obtained, it is highlighted that, in terms of space, the spaces with the largest footage, ranging from 70 m^2 to 85 m^2, stand out, which have been transformed and adapted to auditoriums or classrooms, demonstrating the adaptive capacity of this heritage architecture. The smaller spaces have an average of 30 m^2, enough area to provide office uses, among others.

The circulations are directly related to the courtyard house typology of Arequipa mansions, where spaces such as the hallway, the slopes, and the courtyards maintain a constant structure despite having different stylistic characteristics on their facades. The house's morphology tends to be linear, except for the College of Architects CAP-RA, where the house's shape is understood as a composition by addition. Whatever the case, the courtyards organize these buildings' new uses.

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On the other hand, the balance between built and open determines that the occupied area ranges between 60 m^2 and 80 m^2, keeping the courtyards, hallways, and slopes as open spaces for everyday use, including flexible living spaces, which adapt to the requirements of their current roles. It is important to note that in no case are the open areas used for parking or similar purposes.

Regarding the construction conditions, in all cases, walls were found in a good state of conservation, which highlights the use of ignimbrite in box walls with ashlar and brick configurations with dimensions that for the Alianza Francesa and the College of Architects CAP-RA range between 0.80m and 1.20 m in total width, while in the Arts Center, it has walls from 0.60 m to 0.75 m. This is due to the type of roof, which in the first two cases are ashlar vaults, and in the latter, it is plate with ashlar. The percentage of the original fabric on the first floors ranges between 70% and 90%, with the College of Architects CAP-RA having the most alterations because its spaces follow composition by addition, and one of the original courtyards was transformed into an auditorium. It is worth mentioning that the Alianza Francesa, which is 80% original on the first floor, has grown in height to accommodate spaces of up to three floors with contemporary construction systems. Despite this extension, the percentage of the original unaltered area is valuable.

Among the styles of the Republican era, the neoclassical language stands out, as it predominates in the city's central area, with the Arts Center and the College of Architects CAP-RA exhibiting this style on their facades. On the other hand, the Alianza Francesa has a neo-Renaissance facade with ornamentation and sumptuous features. Those in the neoclassical style have "simple" and less ornate features, where pilasters attached to the wall with cornices in column capital and as a roof finial are used. The openings are part of the facades always contained between these components. The facade of the College of Architects CAP-RA is the smallest; its composition is 5 pilasters with continuous cornices and 3 openings, of which one is the entrance to the building. The Arts Center has 6 terraced pilasters with cornices flanking 4 windows, two on each side of the main entrance. The facade of the Alianza Francesa comprises 8 terraced pilasters with continuous cornices and 4 windows facing the street arranged on both sides of the main door. In the case of neoclassical buildings, the entrances are simple and are contained in the pattern of pilasters and cornices (double in the College of Architects CAP-RA and single in the UCSP Arts Center). In the Alianza Francesa, an ornamental finial on its entrance stands out from the building's general volumetry, a detail that, together with the ornate capitals of its composition, gives harmony to the whole.

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CONCLUSIONS

Photogrammetry was used to thoroughly survey the buildings and the three exterior facades. As for the survey of interior spaces, roofs, or structural details, photogrammetry with close-up object shots was insufficient due to the complexity of the mansions, the lighting levels, and the time for the photographic process. Using instruments and techniques with a higher accuracy level is recommended to survey this type of property properly.

As for the characteristics that the analysis allowed validating, it turns out that at a spatial level, the configuration of the mansions, regardless of the time or style, obeys a courtyard house organization, distributed from an entrance hallway, two courtyards joined by a slope, and side rooms with windows and doors to the courtyards.

Morphologically, the mansions tend to be linear, except for the College of Architects CAP-RA, which shows a grouped configuration. The built and open percentages measured range between 60% and 80% for built and 20% and 40% for open. The uses in the open spaces are functional and organizational, appropriate for courtyards, not vehicles.

In all cases, ignimbrite walls with box walls are evident. The roofs in the Alianza Francesa and the College of Architects CAP-RA houses are barrel vaults, and their wall thicknesses range between 0.80 m and 1.20 m. The UCSP Arts Center has plate roofs and stone block walls with widths between 0.60 m and 0.75 m.

The percentage of conservation of the original fabric in the studied buildings is greater than or equal to 70%, which denotes the adaptability of the original structures to new uses, education, and management. In the case of Alianza Francesa, the extensions followed structures with contemporary materials developed at the bottom of the lot, which respect the building's original facade.

The stylistic characteristics on the facades of the case studies follow the neoclassical in the College of Architects CAP-RA and the UCSP Arts Center and the neo-Renaissance for Alianza Francesa, the former with more straightforward features, without finials in the building's general volumetry. On the other hand, in the latter, there is a higher level of ornamentation and a finial that stands out from the general volumetry of the building.

CONTRIBUTION OF AUTHORS CREDIT

Conceptualization, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Data curation, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Formal analysis, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Acquisition of financing, D.M.-M.; Research, , D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Methodology, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Project management, D.M.-M.; Resources, D.M.-M.; Software, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Supervision, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Validation D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Visualization,

D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Writing - original draft, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.; Writing - proofreading and editing, D.M.-M., F.C.-G., T.M.-S., S.C.-P. y D.L.M.-P.

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BIBLIOGRAPHIC REFERENCES

Almagro, A. (2000). Fotogrametría para arquitectos. El estado de la cuestión [Sesión de conferencia]. Actas del VIII Congreso de Expresión Gráfica Arquitectónica, Barcelona, España. http://hdl.handle.net/10261/19821

Arévalo, J. M. (2004). La tradición, el patrimonio y la identidad. *Revista de Estudios Extremeños*, 60(3), 925-956. https://www.dip-badajoz.es/cultura/ceex/reex_digital/reex_LX/2004/T.%20LX%20n.%203%202004%20sept.-dic/RV000002.pdf

Burga, J. (2010). *Arquitectura vernácula peruana. Un análisis tipológico*. Colegio de Arquitectos de Perú, Perú.

Gonzales Ruiz, L., Brondi Rueda, F., Wołoszyn, J. E Imbertis Herrera, A. (2020). Virtualizando el patrimonio cultural rupestre: el caso del sector "X" en Toro Muerto – Arequipa, Perú. *Devenir*, 7(13), 77-102. https://doi.org/10.21754/devenir.v7i13.765

Instituto Municipal de Planeamiento de Arequipa [IMPLA] (2017). Plan de Desarrollo Metropolitano PDM 2016-2025. *Publicaciones IMPLA, PDM 2016-2025*. https://impla.gob.pe/publicaciones/pdm-2016-2025/

Ministerio de Cultura [MINCUL]. (s.f.). ¿Qué hacemos? Ministerio de Cultura, Información institucional. https://www.gob.pe/institucion/cultura/institucional

Moyano, G. (2017). El uso de fotogrametría digital como registro complementario en arqueología. Alcances de la técnica y casos de aplicación. *Comechingonia.Revista de Arqueología, 21*(2), 333-351. https://doi.org/10.37603/2250.7728.v21.n2.26789

Natividad Vivó, P.Y Calvo López, J. (2010). Levantamiento arquitectónico mediante fotogrametría multimagen aplicada a las Torres de Cuarte. *III Jornadas de Introducción a la Investigación de la UPCT*, (3), 9-11. http://hdl.handle.net/10317/2022

Picon-Cabrera, I., Rodríguez-Gonzálvez, P., Toschi, I., Remondino, F., y González-Aguilera, D. (2021) Building Reconstruction and Urban Analysis of Historic Centres with Airborne Photogrammetry. *Informes de la Construcción, 73*(562), e398. https://doi.org/10.3989/ic.79082

Sánchez López, A. V. G. (2021) Propuesta de una metodología para desarrollar y evaluar técnicas de fotogrametría como herramientas para la realización del mapeo de patologías en elementos patrimoniales [Tesis de Mágister, Universidad Autónoma de Aguascalientes]. *Repositorio Bibliográfico Universidad Autónoma de*

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ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Aguascalientes. http://hdl.handle.net/11317/2186

UNESCO, World Heritage Convention (2000). Centro Histórico de la Ciudad de Arequipa. Report on the reactive monitoring mission. Historical Centre of the city of Arequipa, World Heritage site, Peru Property inscribed on the World Heritage List in 2000 under the criteria C (i), (iv). https://whc.unesco.org/en/list/1016/

Villar, F. A. (2018). Fotogrametría: un aporte sustancial a la lectura de paramentos del sitio ingenio Lastenia (Dpto. Cruz Alta, Tucumán). La *Zaranda de Ideas, 16*(1), 45-57. https://www.scielo.org.ar/pdf/zi/v16n1/v16n1a04.pdf

Zúñiga Alfaro, Á. (2015). El neoclasicismo en la arquitectura de Arequipe, Lucas Poblete, alarife del siglo XIX en M. López, W. Yépez, A. Miranda, C. Quequezana, E. Quequezana, A. Cardona, A. Ramos, J. Bourocle, G. Galdos, A. Málaga, N. Benavente, G. Ballón, Á. Zúñiga, C. Acurio, L. Calatayüd, O. Urday, W. Palomino, G. Ríos, R. Castillo, J. Llanque, M. Huaco, M. Málaga, M. Gómez, L. Maldonado, J. de la Serna, S. Encalada, E. Quiroz, R. Nuñez y Y. Alemán, *Arequipa Patrimonio Cultural de la Humanidad. Reflexiones a los quince años de su declaratoria.* (1 ed., pp. 165-197). DDCA, Publicont SAC. https://www.academia.edu/27340733/Arequipa_Patrimonio_Cultural_de_la_Humanidad_Reflexiones_a_los_quince_a%C3%B1os_de_su_declaratoria

Zúñiga Alfaro, Á. (2022). *Origen y evolución de la vivienda colonial y el estilo mestizo en Arequipa*. Universidad Católica De Santa María

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UNIVERSAL DESIGN AND ACTIVE METHODOLOGIES: A PRACTICE IN POSTGRADUATE STUDIES

DESENHO UNIVERSAL E METODOLOGIAS ATIVAS: UMA PRÁTICA NA PÓS-GRADUAÇÃO

DISEÑO UNIVERSAL Y METODOLOGÍAS ACTIVAS: UNA PRÁCTICA EN LOS ESTUDIOS DE POSGRADO

Figura 0. Mapas tátil. Fonte: Elaborado pelos autores, 2024.

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RESUMO

A disciplina optativa DAU 848 "Estratégias de ensino em Arquitetura e Urbanismo" do Programa de Pós Graduação em Arquitetura, Urbanismo e Paisagismo (PPGAUP) Universidade Federal de Santa Maria (UFSM) explora a reflexão sobre o ensino nos Cursos de Arquitetura e Urbanismo. Em conjunto com o projeto de pesquisa de pós-doutorado "Fabricação digital aplicada ao Desenho Universal e Ergonomia" do PPGAUP, a disciplina abordou no semestre 2023.2 as temáticas de Design Universal (DU) e prototipagem. Com foco nas Metodologias Ativas que incentivam a participação ativa no processo de aprendizagem, o produto final da disciplina consistia no desenvolvimento de um exercício relâmpago voltado para alunos de graduação e em conformidade com as temáticas do semestre. O objetivo deste artigo é apresentar os exercícios finais a partir do procedimento metodológico da disciplina dividido em três etapas: 1) Bases do ensino nos Cursos de Arquitetura e Urbanismo; 2) Ensino de DU; e 3) Desenho e aplicação de exercícios. Como resultado, quatro equipes desenvolveram quatro exercícios abordando mobiliário, gamificação, mapa tátil e sinalética, com discussões sobre o uso da prototipagem e aperfeiçoamentos para futura aplicação na graduação.

Palavras-chave: design universal, acessibilidade, arquitetura, ensino, metodologias ativas.

RESUMEN

La asignatura optativa DAU 848 "Estrategias de Enseñanza en Arquitectura y Urbanismo" del Programa de Posgrado en Arquitectura, Urbanismo y Paisajismo (PPGAUP) de la Universidad Federal de Santa María (UFSM) explora la reflexión sobre la enseñanza en las Carreras de Arquitectura y Urbanismo. En conjunto con el proyecto de investigación posdoctoral "Fabricación digital aplicada al Diseño Universal y Ergonomía" del PPGAUP, el curso abarcó las temáticas de Diseño Universal (UD) y creación de prototipos en el semestre 2023.2. Centrándose en Metodologías Activas que fomentan la participación activa en el proceso de aprendizaje, el producto final del curso consistió en el desarrollo de un ejercicio rápido dirigido a estudiantes de pregrado y de acuerdo con las temáticas del semestre. El objetivo de este artículo es presentar los ejercicios finales basados en el procedimiento metodológico de la disciplina divididos en tres etapas: 1) Bases de la enseñanza en las Carreras de Arquitectura y Urbanismo; 2) Docencia UD; y 3) Diseño y aplicación de ejercicios. Como resultado, cuatro equipos desarrollaron cuatro ejercicios que abarcaron mobiliario, gamificación, mapas táctiles y señalización, con discusiones sobre el uso de prototipos y mejoras para futuras aplicaciones en cursos de pregrado.

Palabras clave: diseño universal, accesibilidad, arquitectura, enseñanza, metodologías activas.

ABSTRACT

The optional course DAU 848, offered by the Postgraduate Program in Architecture, Urbanism, and Landscape Architecture (PPGAUP) at the Federal University of Santa Maria (UFSM), focuses on teaching methodologies in Architecture and Urbanism Courses. In collaboration with the postdoctoral research project "Digital Fabrication Applied to Universal Design and Ergonomics" within PPGAUP, the course explored topics of Universal Design (UD) and prototyping during the second semester of 2023. Emphasizing Active Methodologies that promote student engagement in the learning process, the course culminated in the development of a quick practical exercise designed for undergraduate students and aligned with the semester's topics. This article aims to present the final exercises, structured around the course's methodological framework, which is divided into three stages: (1) Foundations of teaching in Architecture and Urbanism Courses; (2) Teaching Universal Design; and (3) Design and application of exercises. As a result, four teams developed four exercises focused on furniture design, gamification, tactile maps, and signage. These exercises included discussions on the use of prototyping and suggestions for improvements to facilitate future implementation in undergraduate courses.

Keywords: universal design, accessibility, architecture, teaching, active teaching-learning methodologies.

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INTRODUCTION

When preparing future professors, especially in graduate programs, practicing and stimulating critical reflection on teaching methods in undergraduate Architecture and Urbanism courses is needed to generate debate and establish new means of learning. Encouraging students' autonomy and understanding of the processes involved in an architectural project (Freire, 2014; Lawson, 2011), together with practical and experience-based learning (Schön, 2009), helps prepare students to become agents of their own learning. The dialog between reflection and action and active participation in the learning process is based on active methodologies to promote multiple skills and the student's participatory and collaborative attitude (Hoffman et al., 2020). By introducing a new classroom dynamic and enabling students to have practical experiences, academic education is enriched for those who choose to teach and those who decide to follow other professional lines.

In this context, the elective course, DAU 848 - "Teaching Strategies in Architecture and Urbanism," from the Postgraduate Program in Architecture, Urbanism, and Landscaping (PPGAUP) of the Federal University of Santa Maria (UFSM), seeks to encourage a critical view of current teaching methods and stimulate the creativity of Architecture and Urbanism students, emphasizing the relationship between teaching, designing, and learning by doing. By addressing topics such as project processes and conceptual strategies and stimulating creativity, the reflection on postgraduate project teaching contributes to more maturely and consciously preparing new professors concerning their role in society and their work as educators. Conscientious professors train equally committed students and architects, which allows them to create and develop more humane and sustainable projects. This area has been part of the PPGAUP curriculum since 2018, with different focuses. In the first half of 2023, the topics addressed were Universal Design (UD) and Prototyping.

The choice of these topics is directly related to the postdoctoral research project at PPGAUP, "Digital Manufacturing Applied to Universal Design and Ergonomics." This project investigates the use of prototyping technologies in producing teaching materials that help students learn about Ergonomics and UD. Thus, integrating research and the corresponding discipline allowed using these technologies as didactic tools, establishing links between the creative process and teaching these topics in postgraduate and undergraduate studies. In addition, UD became mandatory content in Architecture and Engineering courses with Resolution No. 1 of March 26th, 2021 (Brazil, 2021).

It should be noted that the professional training of ten students in the first semester of 2023 was multidisciplinary. Eight were from the Architecture and Urbanism course, one was from the Industrial Design course, and one was from the Civil Engineering course. PPGAUP has included professors from different areas to stimulate knowledge exchange

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and attract students interested in multidisciplinary research. Focusing on interdisciplinarity and UD, it was defined that Active Teaching-Learning Methodologies (ATLM), associated with the area's final exercise, would be used to create a product. This approach differed from previous editions, where the focus had been on Architectural Design. It is also noteworthy that the subject provided a rich knowledge exchange among students about the different teaching approaches in different courses.

Therefore, this work aims to present the activities of PPGAUP's "Teaching Strategies in Architecture and Urbanism" course, focusing on the final exercise, which consisted of a lightning exercise on UD designed for application in undergraduate classes.

THEORETICAL FRAMEWORK

Universal Design (UD) is the design of products and spaces that can be used by as many users as possible, respecting human diversity and promoting inclusion in daily activities (Mace et al., 1998). In the context of buildings and the role of architects who design them, UD seeks to ensure that built spaces are safe and accommodate different users, eliminating barriers that hinder their use (Goldsmith, 2007). However, it is essential to differentiate the terms "UD" and "accessibility," which can be confused in their application. While accessibility or accessible design seeks to establish minimum conditions to meet a specific range of individuals with mobility difficulties or other restrictions, UD adopts a broader approach to include all users, regardless of their restrictions (Dorneles, 2014).

UD teaching in Architecture and Urbanism courses and other higher education degrees is essential for preparing professionals who are capable of developing accessible and inclusive products, spaces, and buildings. In this vein, the Ministry of Education (MEC) standardized CNE/CES Nº 948/2019 (Brazil, 2019), issued by the National Council of Education (CNE), which made universal design teaching mandatory as of 2021, as part of the core curricula of Higher Education Institutions (HEIs).

Teaching methodologies for UD and Accessibility have already been addressed in the works of Christophersen (2002), Bernardi (2007), Baptista (2013), Dorneles (2014), and Cambiaghi (2017), in addition to Gronostajska and Berbesz (2020). Christophersen (2002) divides these methodologies into theory, user engagement, and evaluation. The theory is the initial critical approach to UD. User engagement involves the participation of people with disabilities in lectures, seminars, or interviews. Finally, the evaluation refers to analyzing and verifying methodologies for developing appropriate products and spaces. Bernardi (2007) proposes using tactile maps as models for reading projects, which would allow the user to be engaged in the teaching process and

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adopt new forms of communication. Baptista (2013) uses methodologies such as awareness, experience, accompanied tours, identification of UD principles, international classification of functionality, ergonomic analysis, and an accessibility master plan. Dorneles (2014) works with strategies involving awareness, understanding of users' needs, transmitting technical knowledge, action, project assessment, and self-assessment. Cambiaghi (2017) adopts methods such as observation and sensitization, post-occupancy evaluation (POE), lectures, seminars, debates, and solution proposals. Finally, Gronostajska and Berbesz (2020) state that UD teaching must contemplate three dimensions: theoretical, empirical, and phenomenological.

Active Teaching-Learning Methodologies (ATLM) focus on encouraging dialog and students' autonomy as reflective and critical subjects. The goal is to make them active participants in the learning process, maximizing their understanding of the content and its applications. Therefore, these methodologies are aligned with the approach of Schön (2009), which emphasizes the role of the student as the primary agent of learning itself. This allows applying both a single approach and a set of methodologies so that competencies and skills are directly or indirectly related to the content studied. Hybrid approaches encourage the development of multiple skills and seek to transform classes into more impactful student experiences, promoting critical thinking, autonomy, and coexistence with diversity (Hoffmann et al., 2020). In addition, new technologies should be integrated and explored, interacting with the digital culture of new generations and encouraging students' active participation in the learning environment.

In architecture, design, and engineering teaching, the methodologies that stand out the most include project-based and problem-based learning, teamwork or team learning, cooperative or collaborative learning, educational games, and the inverted classroom (Hoffmann et al., 2020). These strategies generally focus on student learning, stimulating reflection on a problem, and proposing solutions, individually or in a group (Maziero, 2018).

METHODOLOGY

The discipline was structured into three stages: 1) Teaching guidelines in Architecture and Urbanism courses, 2) UD teaching, and 3) Design and application of exercises. In the first stage, which was dedicated to teaching guidelines in Architecture and Urbanism courses, weekly exhibition classes were held between April and May, accompanied by debates on structuring teaching in the area. These discussions explored conceptual issues such as the curriculum and the triad of research, teaching, and outreach. The students were encouraged to read specific bibliographies for each class beforehand so that they could present their reflections and relate them to experiences from their academic

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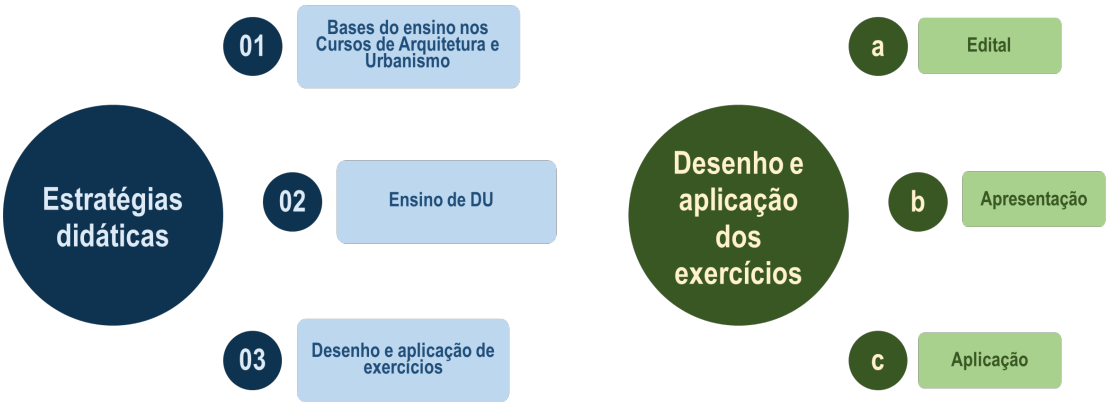

Figure 1. Methodological process. Source: Prepared by the authors, 2024

background. The references used were ***Pedagogy of Autonomy*** (Freire, 2014), ***Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning***(Schön, 2009), ***How Designers Think***(Lawson, 2011), and ***From Diagram to Experiences, Towards an Architecture of Action*** (Montaner, 2017).

After discussing the forms of teaching in Architecture and Urbanism courses, the second stage, which began at the end of May, specifically addressed teaching UD. UD's main concepts and principles, i.e., differentiation regarding accessibility, current legislation, and the types of architectural barriers, were presented. The main bibliographic reference for this stage was the doctoral thesis, ***Universal Design Teaching Strategies in Urban Design Classes*** (Dorneles, 2014).

Finally, in the third stage, held between June and July, the students, organized in teams of two to three, were challenged to develop a lightning exercise on accessibility, which would be tested among classmates. At this stage, the use of ATLM was intensified. The exercise was structured in three main elements: a) a public notification, which should include the description of what would be done, the objective, the necessary materials, and the bibliography (Table 1); b) a presentation in free format, addressing theoretical aspects related to the exercise; c) application and monitoring of the exercise with classmates. The stages of the discipline and the steps of the exercise are illustrated in Figure 1.

Each team was responsible for providing the materials for the activity, with completion expected within the class schedule (4 hours). The other classmates should participate in all activities, try to solve the exercise, and evaluate their positive and negative points through constructive criticism. The team members who conceived the exercise guided and assisted classmates in the activity and recorded the process through photos or videos.

For the exercises, the students had complete freedom in choosing materials. The work could be done by hand or using the machinery available in UFSM's Technology Center (CT) prototyping laboratory called ***Fábrica CT***. Support and follow-up classes were provided before practical application to guide each group.

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Teaching Strategies in Architecture and Urbanism					
Code:	DAU 848	Nature:	Elective	Offer:	PPGAUP
Class:	2023.1	Credits:	3	Classroom hours/ total:	45
Professors					
Objectives					
General objective: to develop signs for predetermined spaces in the CAU/UFSM through parameterization design and digital manufacturing. Specific objective: to present the contents related to signage, LBI, Associacäo Brasileira De Normas Técnicas [ABNT], NBR 9050/2020, and operation of 3D printers available at the factory, Fábrica CT. To design signs for CAU / UFSM. Model in 3D program. To print them on a 3D printer.					
Content					
Signage, NBR 9050/2020, Universal Design, Accessibility, 3D prototyping					
Methodology					
An opening speech introduces the concepts related to signage, LBI, and ABNT NBR 9050/2020, highlighting the requirements of the standards and their importance within collective environments. The class is then divided into groups before presenting the practical class activity. During the activity, the groups have time to search for references and brainstorm, which allows for later presentations of ideas and discussions among all students. Soon after, the project starts using SketchUp software and is exported to Cura. Finally, the groups present their final products and discuss the exercise. The signs will be printed as per Fábrica CT's availability.					
Schedule					
- Presentation of relevant concepts on signage – 10min; - Presentation of the Brazilian Inclusion Law and its mandatory compliance in architecture and engineering projects – 10 min; - Presentation of the chapters on the signage of doors and corridors and their basic concepts from ABNT NBR 9050/2020. 15 min; - Organization of the groups and presentation of the activity – 10 min; - Time for students to search for references and brainstorm within the group for the signage project – 30 min; - Presentation of alternatives and discussion of ideas among all students – 25 min; - Modeling and export time to Cura – 45 min; - Final discussion of the exercise – 20 min.					
Assessment					
Students will be evaluated according to their creativity in creating signage, the functionality of their results, and their compliance with the ABNT 9050/2020 requirements.					
Resources					
Laptop; SketchUp Software; Cura Ultimaker Software; Internet; projector or television; 3D printer.					
Bibliography					
ABNT-Brazilian Association of Technical Standards. ABNT NBR 9050/2020: Acessibilidade a edificações, mobiliário, espaços e equipamentos urbanos. Rio de Janeiro, 2020. BRAILLE TRANSLATOR. Simple and free resource to convert texts to Braille, c2022-2023. Home page. Available at: https://www.tradutorbraille.com.br/. COSTA, Joan. Signage, from signage to program design. Encyclopedia of Design, 1989.					

Table 1. Example of plans made by students. Source: Prepared by the authors, 2024.

PROCESS

Four teams of students designed exercises related to the subject, as shown in Table 2. Below, each exercise is described, and relevant aspects that influenced them are discussed.

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Team	Team members	Purpose of the exercise	Professional training of the team	Duration of the exercise
Team 1	3	Develop signage boards for pre-determined CAU spaces through parameterization design and digital manufacturing.	Architecture and Urbanism Civil Engineering Industrial Design	4h
Team 2	3	Apply a didactic game about accessible circulation in architecture with concepts, pictograms, accessibility, routes, and barriers.	Architecture and Urbanism	4h
Team 3	2	Develop a tactile map for CAU.	Architecture and Urbanism	4h
Team 4	2	Develop accessible urban furniture aiming to promote awareness on the subject.	Architecture and Urbanism	4h

Table 2. Organization of the teams for the exercises. Source: Prepared by the authors, 2024.

Figure 2. Signage. Source: Prepared by the authors, 2024.

Team 1

Team 1's objective was to develop 3D-printed signs for predetermined spaces of UFSM's Architecture and Urbanism [CAU] building: public toilets, elevators, and the PPGAUP study room. The signs should consider the contents related to the signage, the Brazilian Inclusion Law [LBI] (Brazil, 2015), and NBR 9050/2020 (ABNT, 2020).

Initially, those responsible for the exercise presented, through an exhibition class, the relevant concepts on signage, LBI, its mandatory nature in architecture and engineering projects, the signage of doors and corridors, and the basic concepts of ABNT NBR 9050/2020. After the class, the course was divided into groups of two to three students to create the signs. The groups searched for references and brainstormed while receiving guidance on standards, prototyping software, Braille texts, and model design. At the end of the period dedicated to creating the signs, the teams presented their models to the class. This phase was used to evaluate the work collectively regarding the fulfillment of the requirements, the originality of the models, and the clarity of the signs' messages. In addition, this helped plan 3D printing on the available equipment. Finally, the signage was prototyped, as illustrated in Figure 2.

After 3D printing, the participants debated the dynamics of the exercise, identifying flaws and suggesting possible improvements. It was found that

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the absence of photographs of the places where the signs would be installed hindered the exercise, as the students needed to understand the characteristics of the environment. Likewise, there were no measurements or explanations on aspects to be considered for each sign, which made it challenging to design and define criteria for viewing and installing them. Another point raised was the need to include an explanation of the types of typographic fonts and the most appropriate colors for signage in the exercise's initial presentation.

Finally, the students were encouraged to use 3D printing and praised the technology's possibilities. However, they noted the need for further technical studies to avoid errors in prototyping. This aspect can be observed in Figure 2, which shows one of the models with poor quality due to an error in the digital modeling.

Team 2

Team 2's exercise consisted of a didactic game on architectural paths and barriers, adapted from Victorio's doctoral thesis in architecture (2023). Through an exhibition class, the group presented content on circulation in built and urban environments, LBI-based accessibility, and the concepts of pictograms, routes, barriers, UD, and accessibility. In addition, the main rules of the game, called "Concept and ideation," were explained.

The game consists of a board, tokens, objective cards, opportunity cards, concept cards, path cards, barrier cards, and blank cards for solving the barriers. In addition to these components, you need drawing materials, such as a pencil, pen, eraser, and dice. The concepts and pictograms used in the game were outlined and presented in Victorio's master's dissertation (2019), while their structure, components, and rules are detailed in Victorio's doctoral thesis (2023).

Briefly, the game works as follows: the board has four paths, and the objective is to move from one point to another, forming a path using the path cards, which are chosen and placed on the board (Figure 3) according to the concept cards that the player has in hand. Another objective is to relate the photos of the path cards with the pictograms of the concept cards printed on the back of the path cards, allowing comparison at the end of the game. Tokens mark the player's path, while barrier cards must be solved to clear the path. On the other hand, the opportunity cards work as wild cards, helping to overcome obstacles. The game ends when all players reach the destination; at that point, all path cards on the board are turned over to compare the pictograms with each player's concept cards.

The class was divided into two groups of four people for the game, encouraging discussions between the participants. The students were evaluated based on their game scores, creativity, understanding, and ability to analyze routes and solve the presented barriers.

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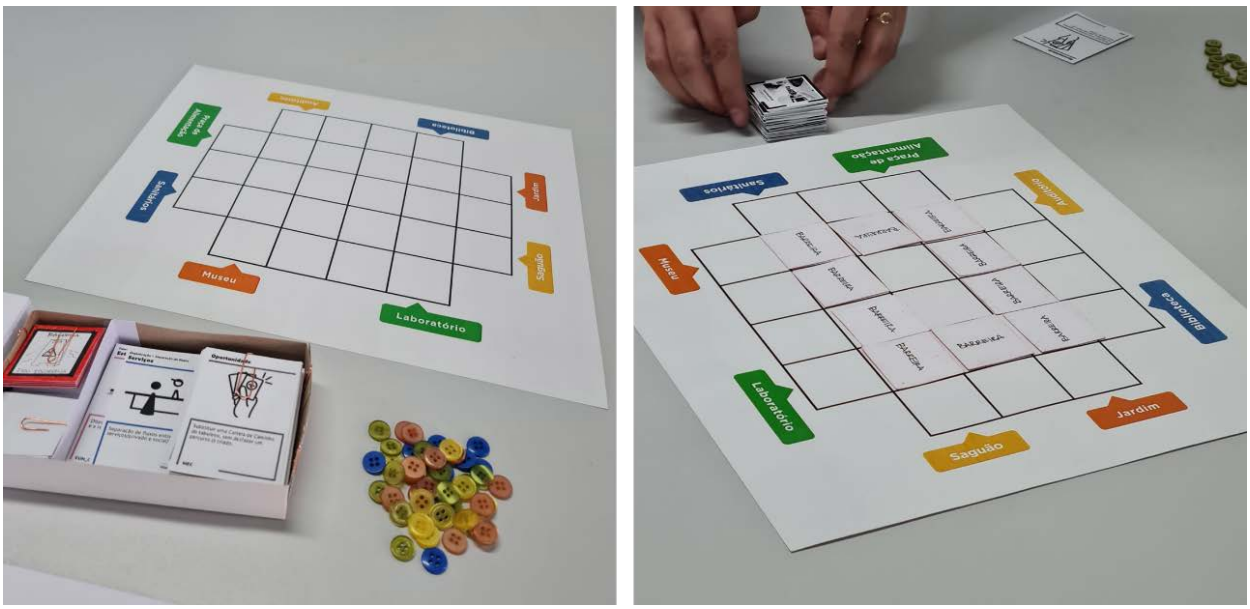

Figure 3. board game. Source: Prepared by the authors, 2024.

The students considered the exercise interesting and fun, expressing positive opinions about the topic and the game's playful approach. The possibility of enlarging the board to create longer paths and introduce more barriers, making the gameplay more challenging, was also discussed. The difficulty in linking the images to the barriers' pictograms was also pointed out, which generated doubts and conflict among the participants. Based on the classroom observations, it was suggested that, before applying the practical activity, the theoretical class include an introduction to the concepts and pictograms that Victorio (2019) developed, assisting the players in associating images and pictograms.

In addition, it was recommended that some game components, such as the tokens and barrier cards, be replaced with colorful 3D-printed parts, making the game visually more attractive. The activity proved an effective alternative for learning about UD, accessibility regulations, and architecture and urbanism projects accessible to audiences with special needs. The game was engaging for the participants and promising as a playful teaching tool. It also facilitated a joint discussion between players, students, and professors about accessible solutions to the accessibility barriers presented in the game.

Team 3

Team 3's exercise aimed to make a tactile map of UFSM CAU using different handmade materials. The exhibition class for the exercise addressed the history of the tactile map, the most commonly used materials, manufacturing methods, and the Braille writing process, which was demonstrated with a ruler and punch. The UFSM Coordination of Educational Actions (CAED, in Portuguese) loaned the materials needed to write in Braille.

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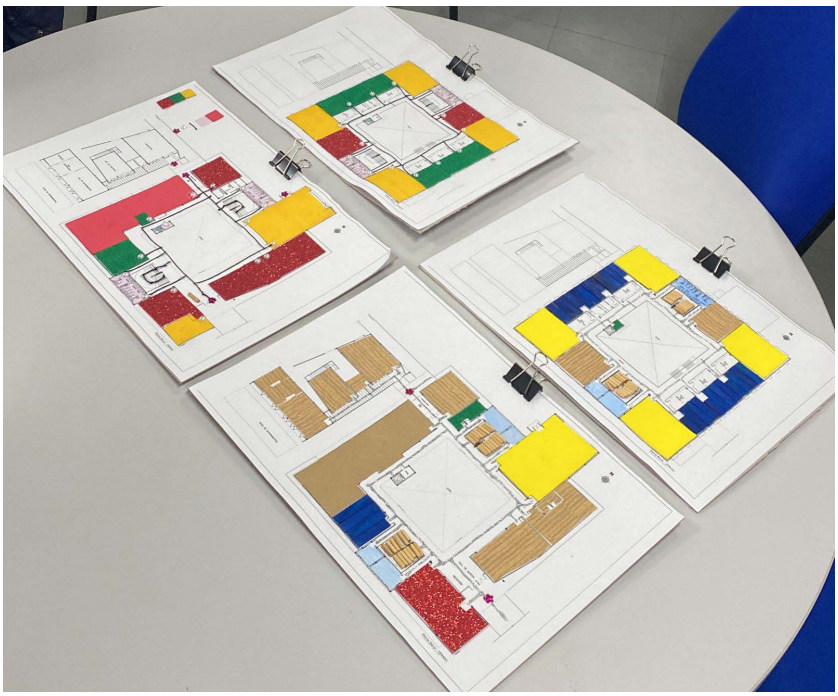

Figure 4. Tactile maps. Source: Prepared by the authors, 2024.

The students were divided into two groups of three members, each responsible for representing the ground and second floor of CAU. The maps were made using glue, scissors, adhesive tape, colored threads and cords, paper, buttons, and beads (Figure 4). The groups had to follow a basic zoning of the environments, identifying workshops, theoretical classrooms, laboratories, toilets, service areas, teachers ' room, and auditorium. It was also necessary to differentiate the paths and access to the spaces. At the end, each group presented its proposal, and discussions were held about the results obtained. The evaluation considered both the map's completeness and the use of creative solutions to represent the spaces.

In the final discussion, the different forms of demarcation used by the groups were observed, especially on the rooms' doors. While one group used beads as a reference, the other cut out textured foam and positioned it in front of the entrance. One group used lines to mark the paths, while the other chose glitter glue.

Among the suggestions for improvement, the need for more time for the activity and the possibility that the base map already had some previous demarcations of the limits of the environments were highlighted, thus optimizing the process. It is concluded that the activity achieved its objective, allowing students to experiment with different textures to represent the environments and get to know the Braille handwriting process. For future editions, it is recommended that visually impaired people participate in evaluating the maps produced in the classroom.

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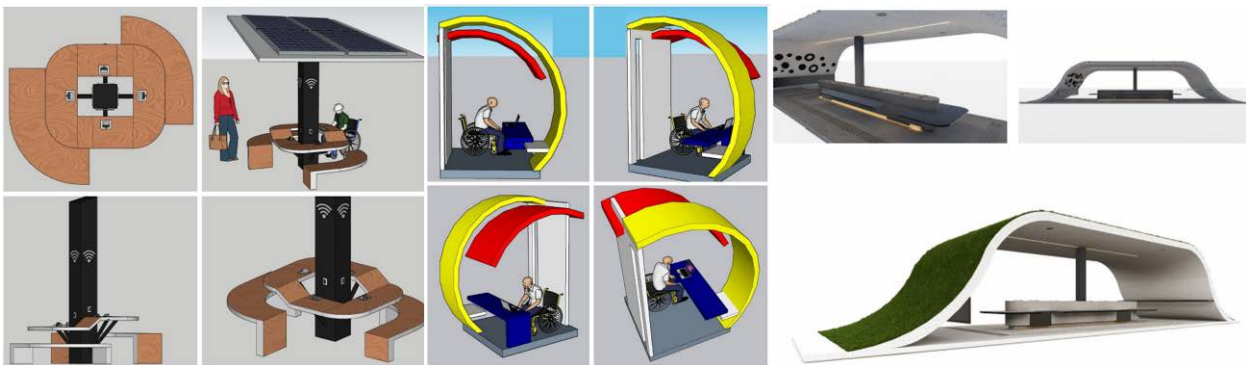

Figure 5. Accessible urban furniture. Source: Prepared by the authors, 2024.

Team 4

Team 4 sought to develop accessible urban furniture. The exhibition class presented content on urban furniture and the NBR 9050/2020 and examples of existing furniture, so students became familiar with the topic before starting their projects. The class was divided into three pairs, each responsible for designing furniture adapted to a specific user: blind people, wheelchair users, and little people. The teams had the opportunity to explore different approaches to creating accessible street furniture, considering the particular needs of each group. Teamwork enabled the exchange of ideas and promoted a broader understanding of these users' various limitations and challenges.

Projects could be submitted in physical or digital format. At the end of the exercise, the students presented their proposals and participated in a discussion about the ideas. The evaluation considered the creativity in furniture design, the projects' functionality, and its relationship with the principles of accessibility and Universal Design.

During the presentations, students explained and justified their choices and approaches, demonstrating an in-depth understanding of the accessibility and inclusion demands met by each proposal. Figure 5 illustrates the proposals' presentations, where the groups exhibited their projects in a three-dimensional format on television.

In Proposal A, the Wi-Fi booth was designed to focus on people with dwarfism, but other users could also use it. The furniture has 2 levels, with one portion of the table at 55 cm high and a seat at 30 cm, while the other has a table at 70 cm and a seat at 45 cm. In addition, a part of the seat was suppressed to allow use by wheelchair users, both adults on the highest level and children on the lowest level. The seats and table are designed with curved shapes, allowing more people to utilize the space simultaneously. The furniture has four triple sockets on the tables and two more on the pillar. To make the structure sustainable, photovoltaic panels were added for power generation.

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In Proposal B, a booth was developed for wheelchair users. The project starts from a module with a central bench, where power supply points are located in two places, ensuring accessibility for wheelchairs and other users. In addition, the modules can be mounted singly or combined side by side, providing greater flexibility of use.

Proposal C's public Wi-Fi station is designed for people with visual impairments. To facilitate its identification in green areas, the structure features high color contrast and retractable seats, allowing more flexibility to users. Tactile floors were incorporated to facilitate the movement of people with visual impairments, and sound boxes were used to provide essential information and assist users. The structure is open on both sides, avoiding obstacles and minimally interfering with the space where it will be installed.

With the collective presentations, it was possible to understand each project and the furniture's development process, which, although different from each other, provided accessibility for their respective audiences. All pairs sought to expand the number of users contemplated, aligning their projects to the concepts of UD. However, the three groups delivered their projects in 3D images, without Floor Plans, side views, or other forms of representation, which made it difficult to understand and verify specific measurements. This highlighted the importance of previously defining the format and the items to be delivered to ensure a more complete and detailed presentation.

At the end of the presentations, the groups discussed their perceptions about the activity and the relationship between the projects. They provided a broader analysis of the class and identified points that could be improved in future reproductions of the experience.

FINAL DISCUSSIONS

The four teams conducted dynamic exercises that can be applied in undergraduate Architecture and Urbanism courses, stimulating awareness about Universal Design and users' relationships with the built environment. At the end of each activity, students identified opportunities and challenges between the initial planning and its application in class, discussing the adjustments needed for each case.

Although not all teams used prototyping, the students debated how the technology could be incorporated into the exercises, concluding that only a few adjustments would be needed for the initial proposition. The importance of perfecting the exercises was also discussed, complementing the theoretical part presented in the initial presentation to facilitate the understanding of who will perform them.

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Also, the stages before the exercise – where teaching in Architecture and Urbanism courses and the teaching of UD were discussed – proved sufficient to encourage reflection on the topic. ATLM was present from the first two stages, encouraging students to seek bibliographies outside those proposed by the subject and enriching exchange and discussion in the classroom. However, its application became more active in the third stage, when, after the theoretical foundation, the students needed to conceive and develop an exercise for their colleagues.

Regardless of working in teams, the students received support and advice from their classmates, which ensured the multidisciplinary exchange of knowledge, enriched by the class's different academic backgrounds.

CONCLUSIONS

Active Teaching-Learning Methodologies (ATLM) in student-centered learning stimulate creativity in solving problematic situations and proposing different solutions to the same challenge. With the inclusion of Universal Design (UD) in Architecture and Urbanism courses and engineering, ATLM emerges as one of the learning methodologies capable of encouraging students to reflect on the subject, addressing both theoretical and practical aspects of the relationship between different types of users and the built environment.

The objective of this article was to present the work implemented in PPGAUP's "Teaching Strategies in Architecture and Urbanism" subject. It focused on the final exercise, which used ATLM for UD lightning exercises and explored the potential of prototyping technology. As a result, four teams conducted exercises addressing furniture, gamification, tactile maps, and signage. Each proposal brought a unique perspective on UD in architecture and urbanism teaching, resulting in distinct products and contributing to the diversification of approaches to accessibility in the academic environment. After applying the exercises in class, at the end of the course, possible improvements were identified for future editions of the activity.

In short, the final exercise successfully promoted awareness of UD in the built environment by engaging students in developing inclusive and creative solutions. By addressing interdisciplinary and practical topics, the activity provided students with a broader view of the possibilities and responsibilities of the architecture and urbanism professional regarding accessibility and the promotion of equal opportunities for all.

AUTHOR CONTRIBUTIONS CREDIT

Conceptualization, S. DP., V. D.; Data curation, S. DP., V. D.; Formal analysis, S. DP., V. D.; Obtaining funding, V. D.; Research, S. DP., V. D.; Methodology, V. D.; Project Management, S. DP., V. D.; Supervision, S. DP., V. D.; Validation, S. DP., V. D. Writing - original draft, S. DP., V. D.; Writing-proofreading and editing, S. DP., V. D.

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BIBLIOGRAPHIC REFERENCE

Associacão Brasileria de Normas Técnicas [ABNT]. (2020). *NBR 9050: Acessibilidade a edificações, mobiliário, espaços e equipamentos urbanos*. Rio de Janeiro, 2020.

Baptista, A. (2013). Argumentos, estratégias e técnicas no ensino do Desenho Universal em cursos de Arquitetura e Urbanismo. In: *IV Encontro Nacional De Ergonomia Do Ambiente Construído/V Seminário Brasileiro De Acessibilidade Integral*. Anais, Florianópolis.

Brasil (2015). *Lei nº 13.146, de 6 de julho de 2015*. Institui a Lei Brasileira de Inclusão [LBI] da Pessoa com Deficiência (Estatuto da Pessoa com Deficiência). Brasília, DF: Diário Oficial da União.

Brasil (2019). Ministério da Educação. Conselho Nacional de Educação. *Parecer CNE/CES nº 948/2019*. Alteração da Resolução CNE/CES nº 2, de 17 de junho de 2010, que institui as Diretrizes Curriculares Nacionais do Curso de Graduação em Arquitetura e Urbanismo, bacharelado, e alteração da Resolução CNE/CES nº 2, de 24 de abril de 2019, que institui as Diretrizes Curriculares Nacionais do Curso de Graduação em Engenharia, em virtude de decisão judicial transitada em julgado. Brasília: Ministério da Educação. http://portal.mec.gov.br/docman/outubro-2019/128041-pces948-19/file

Brasil (2021). Ministério da Educação. Conselho Nacional de Educação. *Resolução nº 01/2001, de 26 de março de 2021*. Dispõe sobre as diretrizes curriculares nacionais dos cursos de graduação de Engenharia, Arquitetura e Urbanismo. Brasília: Ministério da Educação. http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=175301-rces001-21&category_slug=marco-2021-pdf&Itemid=30192

Bernardi, N. (2007). *A aplicação do conceito do desenho universal no ensino de arquitetura: o uso de mapa tátil como leitura de projeto* [Tese doutorado em Arquitetura e Urbanismo]. Universidade Estadual de Campinas, Campinas.

Cambiaghi, S. (2017). *Desenho Universal: métodos e técnicas para arquitetos e urbanistas*. São Paulo: editora Senac.

Christophersen, J. (2002). *Universal Design: 17 ways of thinking and teaching*. Husbanken.

Dorneles, V. G. (2014). Estratégias de ensino de desenho universal para cursos de graduação em Arquitetura e Urbanismo [Tese doutorado em Arquitetura e Urbanismo]. Universidade Federal de Santa Catariana, Florianópolis.

Freire, P. (2014). *Pedagogia da autonomia: saberes necessários à prática educativa*. São Paulo: Editora Paz e terra.

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ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Goldsmith, S. (2007). *Universal Design*. Londres: Routledge, 2007.

Gronostajska, B. E., y Berbesz, A. M. (2020). Universal design in the education of architecture students. *World Transactions on Engineering and Technology Education*, 18(3).

Hoffmann, A. T., Jacques, J. J. D., Silva, T. L. K. D. y Silva, R. P. D. (2020). Revisão sistemática da literatura: metodologias ativas de ensino-aprendizagem e sua utilização nos cursos de design, engenharia e arquitetura en Nuñez, G. J. Z., y Oliveira, G. G. (Orgs.). *Design em pesquisa: vol 3*. (p. 34-54). Porto Alegre: Marcavisual,

Lawson, B. (2011). *Como arquitetos e designers pensam*. São Paulo: Oficina de Textos, 2011.

Mace, R. L., Story, M. F., y Mueller, J. L. (1998). The Universal Design file: designing for people of all ages and abilities. Raleigh: North Carolina State University School of Design.

Maziero, L. T. P. (2018). Ensino de topografia no curso de arquitetura e urbanismo por meio de aprendizagem ativa. *PARC: Pesquisa em Arquitetura e Construção*, 9(3), 179-191. https://doi.org/10.20396/parc.v9i3.8651722

Montaner, J. M. (2017). *Do diagrama às experiências, rumo a uma arquitetura de ação*. São Paulo: Gustavo Gili.

Schön, D. A. (2009). *Educando o profissional reflexivo: um novo design para o ensino e a aprendizagem*. Porto Alegre: Penso Editora.

Victorio, E. R. (2019). As questões da circulação em arquitetura com base na análise de soluções de projetos contemporâneos [Dissertação mestrado em Arquitetura e Urbanismo]. Universidade Estadual de Campinas, Campinas.

Victorio, E. R. (2023). A circulação em arquitetura e sua representação gráfica para um jogo de apoio ao processo de projeto [Tese doutorado em Arquitetura e Urbanismo]. Universidade Estadual de Campinas, Campinas.

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CENTENNIAL THEATER BUILDINGS IN SAN JUAN, ARGENTINA: BETWEEN LYRICAL TYPOLOGY AND ALTERNATIVE SPACES

SALAS TEATRALES CENTENARIAS EN SAN JUAN, ARGENTINA: ENTRE LA TIPOLOGÍA LÍRICA Y LOS ESPACIOS ALTERNATIVOS

EDIFÍCIOS DE TEATROS CENTENÁRIOS EM SAN JUAN, ARGENTINA: ENTRE TIPOLOGIA LÍRICA E ESPAÇOS ALTERNATIVOS

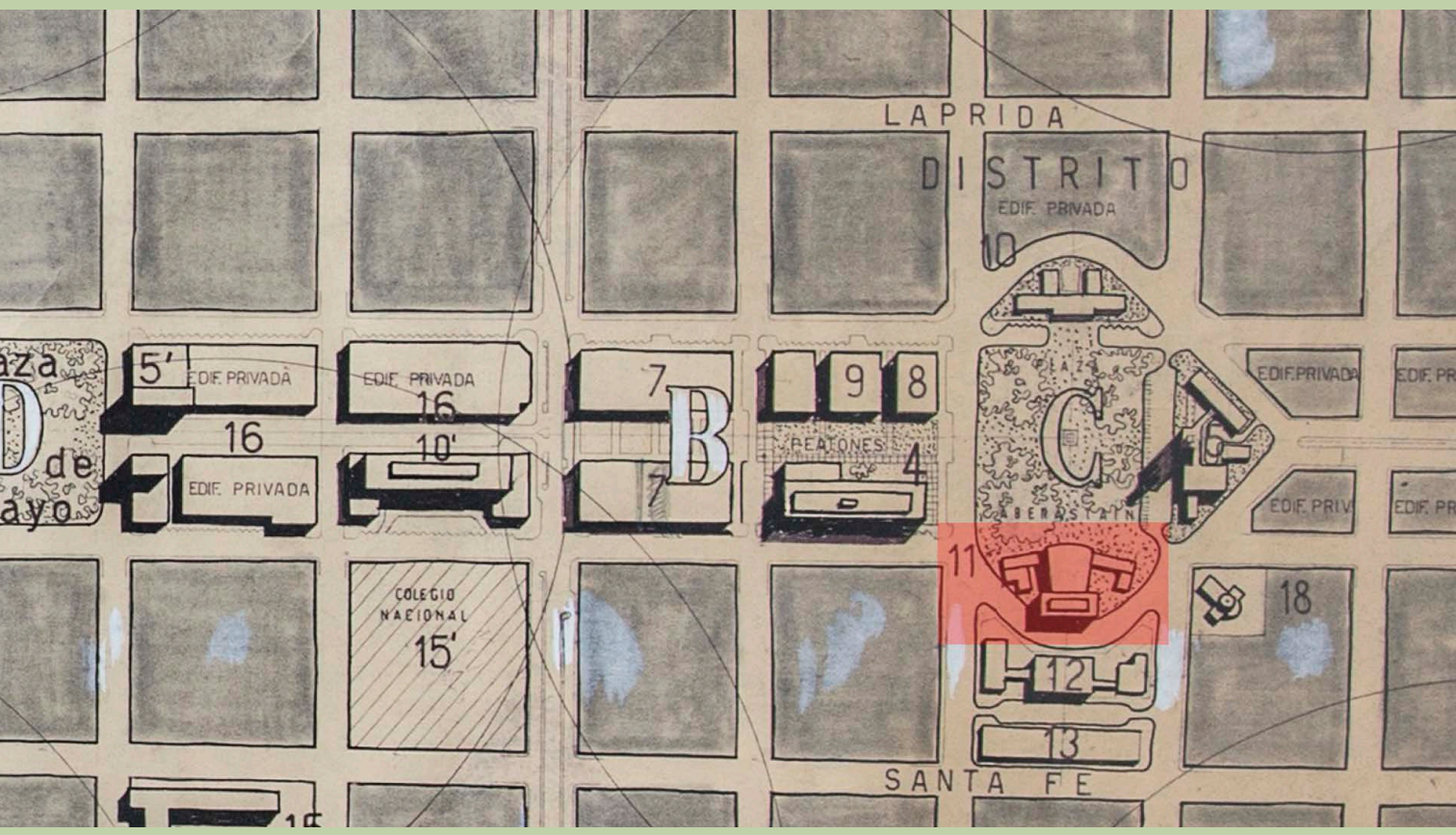

Figura 0. Detail of the Urban District of the Juan José Pastor Architectural Plan (11 is the Auditorium). Source: Urban History Museum (1948).

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RESUMEN

Este artículo ofrece resultados originales sobre las salas teatrales en San Juan, Argentina. La investigación inédita desarrollada fue de tipo exploratoria y hace foco en una circunstancia repetida en la ciudad. Para los festejos de los centenarios del país, se coincidió por levantar un teatro importante para la ciudad. En el año 1910, el Coliseo iba a convertirse en el escenario más importante, pero su construcción fue truncada y nunca se terminó; cien años después se inauguró el Teatro del Bicentenario. En el tiempo transcurrido, estos dos proyectos llevados a cabo por el Estado, presentan obvias divergencias y curiosamente, verifican notables similitudes lo que motiva a plantear la discusión teórica sobre Tipología. En ambos casos, el artículo indaga la actividad teatral local, que se mantuvo vigente por más de un siglo en dependencia de los cines y otros edificios alternativos (clubes, bibliotecas, escuelas, viviendas), las que no se identificaban con una imagen del teatro tradicional. Así se presentan, dos formas arquitectónicas que conforman parte el patrimonio cultural y material del arte dramático urbano.

Palabras clave: ópera, modelos, estado, teatro, ciudad

ABSTRACT

This article provides original results about theaters in San Juan, Argentina. The unpublished research was exploratory and focused on a repeated circumstance in San Juan. It was agreed to build an important theater for the city to celebrate the country's centenary. In 1910, the Colosseum was going to become the most critical stage. However, its construction was cut short, and it was never finished. One hundred years later, the Bicentennial Theater was inaugurated. In the time that has passed, these two state-led projects present evident divergences and curiously noteworthy similarities that motivate us to discuss the theoretical aspects of the typology. In both cases, the article investigates the local theater activity, which remained active for over a century, relying on cinemas and other alternative buildings (clubs, libraries, schools, homes), which were not identified with a traditional theater image. Thus, two architectonic forms that are part of the cultural and material heritage of the art of urban theater are presented.

Keywords: opera, models, state, theatre, city

RESUMO

Este artigo apresenta resultados originais sobre salas de teatro em San Juan, Argentina. A pesquisa inédita realizada foi de caráter exploratório e se concentrou em uma circunstância recorrente em San Juan. Para comemorar o centenário do país, foi acordada a construção de um importante teatro para a cidade. Em 1910, o Coliseu se tornaria o palco mais importante. No entanto, sua construção foi interrompida e nunca foi concluída. Cem anos depois, foi inaugurado o Teatro do Bicentenário. No tempo transcorrido, esses dois projetos liderados pelo Estado apresentam divergências óbvias e, curiosamente, semelhanças notáveis que nos motivam a levantar a discussão teórica sobre a tipologia. Em ambos os casos, o artigo investiga a atividade teatral local, que permaneceu ativa por mais de um século, contando com cinemas e outros edifícios alternativos (clubes, bibliotecas, escolas, residências), que não se identificavam com a imagem tradicional do teatro. Assim, são apresentadas duas formas arquitetônicas que fazem parte do patrimônio cultural e material da arte dramática urbana.

Palabras clave: ópera, modelos, Estado, teatro, cidade

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INTRODUCTION

This article presents and analyzes the first official theater in the city of San Juan [1], opened to celebrate the country's second centenary of independence. The building was examined through a historical perspective, which motivated the first review of local theatrical activity spaces since their inception.

In the history of San Juan's architecture, it seems contradictory that, despite a vibrant theatrical activity, no buildings were designed for that purpose. Perhaps, even for this reason, there was no history of studies on local theater spaces. This research is conducted to become an inaugural contribution to the recognition of the architectural spaces that framed theater in the city. The review of both situations determined the uniqueness of identifying two important cases in the more than a century-long study period. Both examples are lyrical theatrical typologies that complement other spaces that were, and still are, adapted for theater purposes.

Adapted buildings and those built for theatrical performance constitute a heritage where the imprint this artistic discipline leaves on any city can be partially rescued. Although theater is often an art of the present, and the space that contains it is considered an accessory, the legacy of performances determines in the audience unprecedented ways of looking, thinking, and interpreting the architecture portrayed and experienced in the performance itself.

The research registered the spaces used for San Juan's theatrical activity for over a hundred years (1905-2016), focusing on two landmark buildings: the city's most important halls, such as the Coliseo from 1910 and the Bicentennial Theater in 2016.

The study detected that the validity of theatrical activity in the city was initiated, consolidated, and endures in:

- Adapted areas (housing, commercial premises, and later, in cinemas),
- Private institutions with an assembly hall among their facilities (schools, clubs, libraries, institutes, banks) and
- A single official building designed and built by the provincial State, inaugurated in 2016.

Until a few years ago, San Juan did not have an example of an architectural model of a building built for the theater. Therefore, no typological evolution accompanied the development and growth of this artistic activity. Although active vocational casts, some private academies, and even the university theater degree program continuously proposed innovative productions with original dramaturgy, where they took place was not overly important; and ***what*** and ***how*** were more essential than ***where*** the theatrical act was being held or performed.

1 San Juan is a small-scale province, located in central-western Argentina.

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Without a specific architecture for theater and particular studies on the subject, the research chronologically reconstructed the network of theater spaces in San Juan to discover whether their characteristics could be incorporated and materialized in the Bicentennial Theater. Given the qualities forged by San Juan's contemporary theatrical activity, a debatable resolution is evident.

METHODOLOGY

Even though there were studies and publications on dramaturgy and theatrical activity, this article presents the first results on buildings that hosted these events. The press was consulted as a primary source so the story of the locations and their periods of operation could be determined. On the other hand, the addresses were classified according to the original uses of the buildings: public (schools and neighborhood unions), private with modifications (housing, commercial premises, movie theaters), and finally, without spatial alterations (warehouses and marquees).

Except for social clubs, there were 17 appropriate spaces to build the theater in San Juan. These spatial alternatives for theatrical use were kept during the reconstruction of San Juan (from 4 to 5 rooms active during the decades of the 1950s and 1960s), and later, the quality for appropriating other buildings (in which seven on average in the last 40 years had functions) was retained. It should be clarified that many of these do not exist today because they were demolished or remodeled for commercial purposes. However, some photographic records give an account of their activity.

Given the background information found, the research focuses on analyzing the formal characteristics of the spaces and styles (as appropriate), which leads to taking the concept of typology as a central theoretical basis.

DEVELOPMENT

Theatrical activity in the neighborhood

Various chronicles quoted in the book ***Writings about the San Juan scene*** of Alicia Castañeda (2011) agree that the history of theater in San Juan begins in the early decades of the 19th century, and that its first performances were held to provide social and cultural exchange during the long and peaceful nights of San Juan.

Theater proposed cultured entertainment, teaching, adherence to good customs, and social figuration, taking shape in specially conditioned domestic spaces. The functions took place in the homes of well-to-do families, according to Fernández (2001), "motivated by societal needs channeled by the most enlightened citizens themselves in the face of State apathy" (p. 24). The theatrical imaginary was forged in an elite that could

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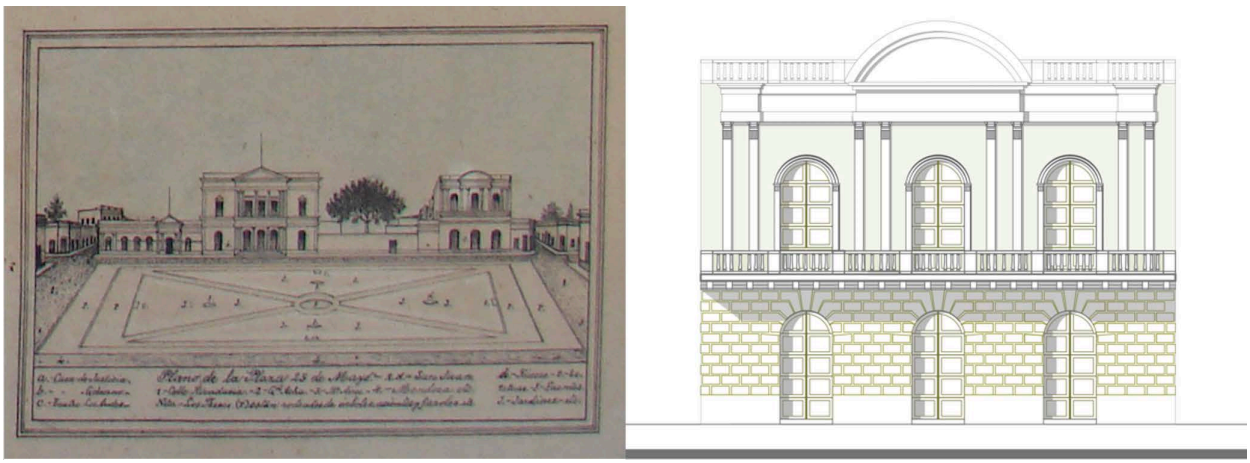

Figure 1. Plan of the 25 de Mayo Square, Vera's drawing from 1891 (Los Andes Theater can be distinguished on the right), and a graphic reconstruction of the facade, according to photographs from the Agustín Gnecco Museum. Sources: CEDODAL (Documentation Center of Latin American Architecture) / drawing by Nicolás González, 2024.

see these vocational groups and the visiting casts in touring shows perform. Both artists could perform their works in private premises with a basic setup: a room where chairs could be placed and a painted drop curtain hung.

San Juan's spectators became regulars and interested attendees, as the spectacle enlivened the monotonous rhythm of their daily lives. The newspaper La Unión reports that by 1880, the Los Andes Theater was already operating with intense activity from operetta, zarzuela (Spanish musical theater), and dramatic art companies. This building belonged to a group of merchants who received a state subsidy, exempting them from paying taxes and allowing them to organize various events (Fernández, 2001). The continuity of functions promoted an educated artistic taste among the public. The different genres hired conditioned the building to require constant maintenance, leading to criticism. "The public's first impression of the company that performs in Los Andes was unfavorable. This is not strange... added also the inconveniences of premiering in an uncomfortable and unfinished theater", appreciations of the newspaper review on June 4th, 1988. It is presumed that this was the only room with general and elite boxes, galleries, stalls, and a candy store. As for its characteristics, the theater appears in a drawing by Cirilo Vera in front of the 25 de Mayo Square, on the same sidewalk as the Government House (Figure 1).

The Los Andes Theater had a layout similar to other halls within the country. These halls sport Italianate neoclassical decorative styles, with cushioning, classical columns, balustrades, and finial arches. Under this guise, the only theater in San Juan also adhered to the European opera model, which was gaining worldwide popularity, although this hall was not exclusive to one genre. Studies on the theatrical theme in Argentina have shown that this theater could be considered second-rate because of the number of companies that performed. Later, severe damage was done to the building due to the earthquake that hit the area in 1894, resulting in its demolition. Even though its absence created the need for San Juan to have a theater again, building such a space would take more than a hundred years.

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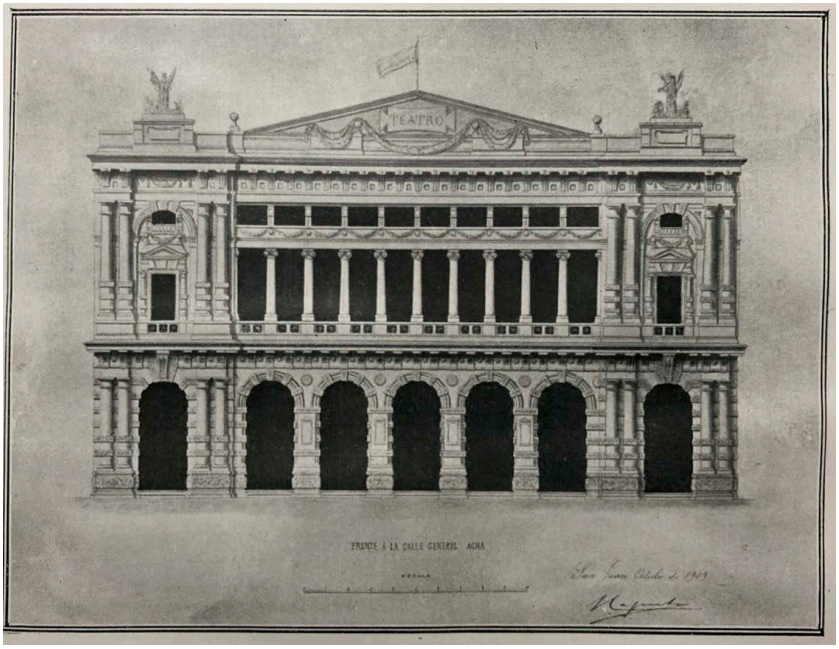

Figure 2. Facade of the New Theater. Source: Arquitectura recobrada. Vizcaíno, 2021.

The Coliseo, a municipal theater

In the early 20th century, despite the regular railway service, the more than 1,100 km distance between Buenos Aires and San Juan seemed to remain the same. Despite the constant rhythm of the colonial atmosphere, the city's changes were delayed. The prosperous and growing Argentina of that time proposed multiple projects to be built throughout the country to celebrate its first centenary. For San Juan, several of these would foster the transformation of the village into a city.

Around 1904, San Juan's people expected to show off new public buildings with different styles. The idea of cosmopolitanism permeated these projects' language. These were made known through newspapers, brochures, and gazettes, announcing that the State would change the modest appearance of the village of San Juan. Among other buildings, the plans of the Municipal Theater of San Juan, also known as the Coliseo or Colosseum, stand out in the book "Centenario Argentino", highlighting the interest in constructing that building around May 1910 (Figure 4). Lyrical theater took the lead and, in general, so did musical theatrical performances with major productions, which according to Méndez and García Falcó (2012) "also required architectural spaces with a strong, almost lavish institutional identity" (p. 35).

It is evident that a city without architects, as in San Juan during the 20th century, had to resign itself to what was being designed in Buenos Aires, where the prevailing aspiration was to turn the great capital into the Paris of South America. The drawing of the main facade of the Coliseo Theater (Figure 2) is a worthy example of the prevailing Academicism, which omits any colonial aftertaste. In this way, a new

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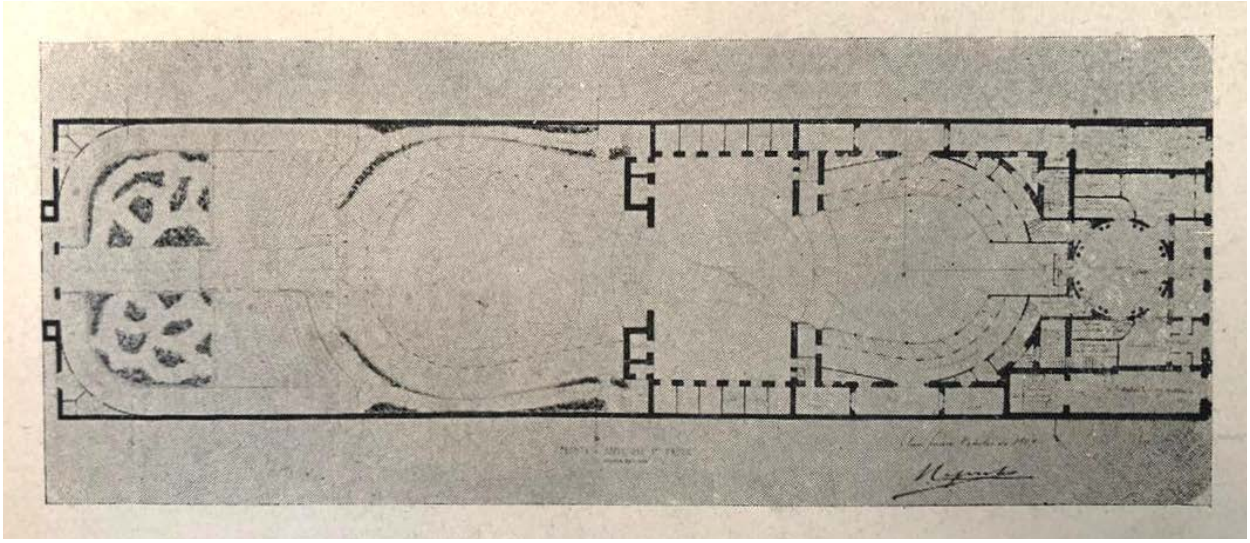

Figure 3. Floor plan of the Coliseo Theater. Source: Arquitectura recobrada. Vizcaíno, 2021.

canon of architectural beauty is formed for the village's drabness: symmetry, order, proportion, and modulation through the cushioning in its plinth, mannerist pilasters, moldings, styled columns with balusters, and the roof of the loft emerging between two sculptures.

The exuberances are not only in the aesthetics of the façade, but also account for the size of the building. The site allowed for a double facade and functionality along two streets: the closed room facing 25 de Mayo Square and an open-air theater for summer functions (Figure 3). The Italian-style theatre typology is interpreted correctly, given that it needs to be built essentially as a lyrical and ballet theatre**2**. The room was designed as a horseshoe fitting into the rectangle, with stalls and three floors with balconies. This model reveals the Europeanizing aspiration within the immigrant framework flowing throughout the country. For this reason, a building with this hierarchy fulfills the need to preserve cultural ties with the countries of origin and also to integrate, according to Schmidt (2018), "the new place of residence in tune with the political interweaving of actors and the consolidation of State institutions" (p. 14).

It should be noted that the project's most unique contribution focuses on the stage, which acts as an articulator to determine mirrored stalls, whose use alternates according to the season. The stage is a proscenium of parallel curtains, and a rotating floor was available to dynamize the change of scenery. According to Tusquets (2019), this setup represents "an unprecedented contribution, an authentic innovation" (p. 95). It is important to emphasize that behind the Italian typology, the Coliseo installs modernity by proposing an unprecedented spatial order of the building, specifically in the exterior-interior relationship. Of course, therein lies the project's fundamental value, of belonging, as defined by Waisman (2009), where a program

2 The story of other Argentine cities show that opera was the main genre used to construct the new halls: Rivera Indarte in Córdoba, Argentino de la Plata, El Círculo in Rosario, or Juan de Vera theater in the city of Corrientes, among others.

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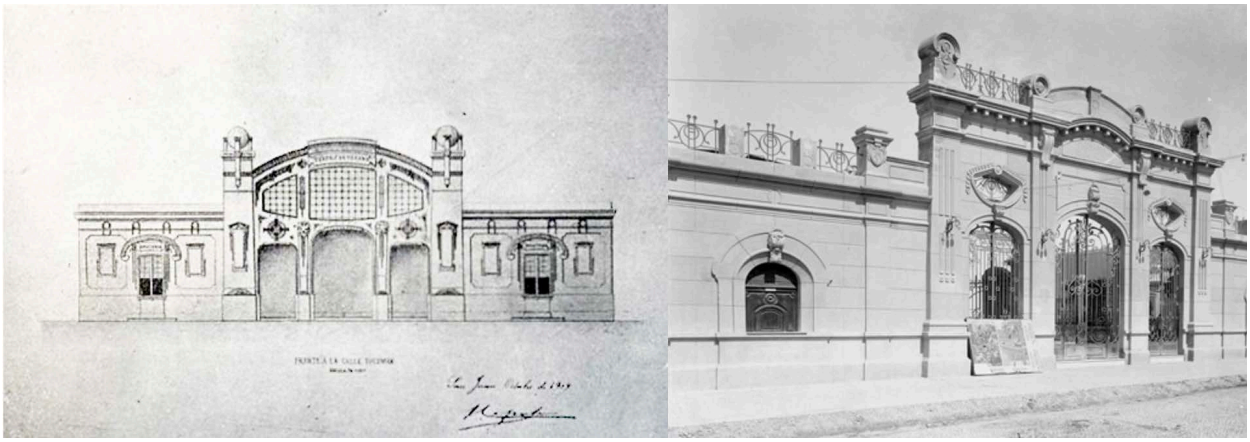

Figure 4. Drawing of the project and built facade of the Coliseo Theater (1910). Source: Arquitectura recobrada, 2021.

adheres to a typology that adapts to local customs, such as attending a summer show under the stars.

After the effervescent period of the first centenary, the results were not as the State expected, and San Juan slowly changed its physiognomy. According to Videla (1989), without a master plan that included the Museum of Fine Arts, library, and especially a large hall, "Architecture for culture ended up being a set of loose and improvised initiatives, almost all either never or only half built" (p. 719). Consequently, only the outdoor theater was built in the Coliseo along with minor works of facadism on the sidewalk side (Figure 4), which means one can presume, according to the posters in the photographs, that films were screened there.

The theater between movies

Despite not having a building for this purpose, San Juan residents retained their enthusiasm for theater, mainly due to the influx of cultural and entertainment events organized by migrant societies, which, as Fernández mentions (2011), consolidated an audience for the demand. From the end of the 1920s, theatrical activities were held at the Estornell Theater (Figure 5), the only establishment available after the Los Andes Theater disappeared. By then, the schedule offered was interspersed with film screenings, which, over the years, dominated the entertainment billboard.

It should be noted that, at that time, the Spanish, Lebanese, and Italian collectives' clubs included theatrical activities in the program for their venues, with a stage inside a large enclosure used for all kinds of meetings (parties, assemblies, congresses). This was the case of the Casa Italia, a project by Alula Baldassarini (Figure 6) that, according to Girones de Sánchez (2005), "had a large party room, private rooms, and an acoustic theater" (p. 144).

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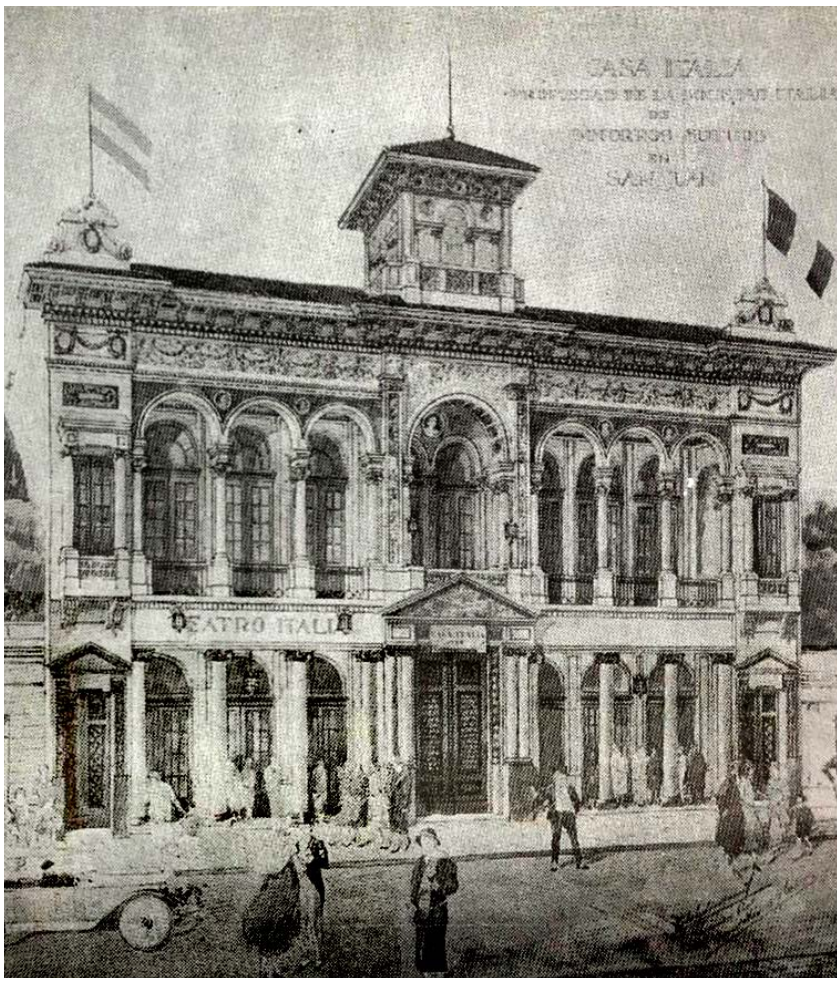

Figure 5. The theater stands out on the Casa Italia (1929) facade, an unbuilt project.
Source: Arquitectura recobrada. Vizcaíno, 2021.

Figure 6. The Cervantes and the Estornell cinema-theater deployed novel architectural languages in San Juan. Sources: Urban History Museum - The Tribuna Newspaper, 1942.

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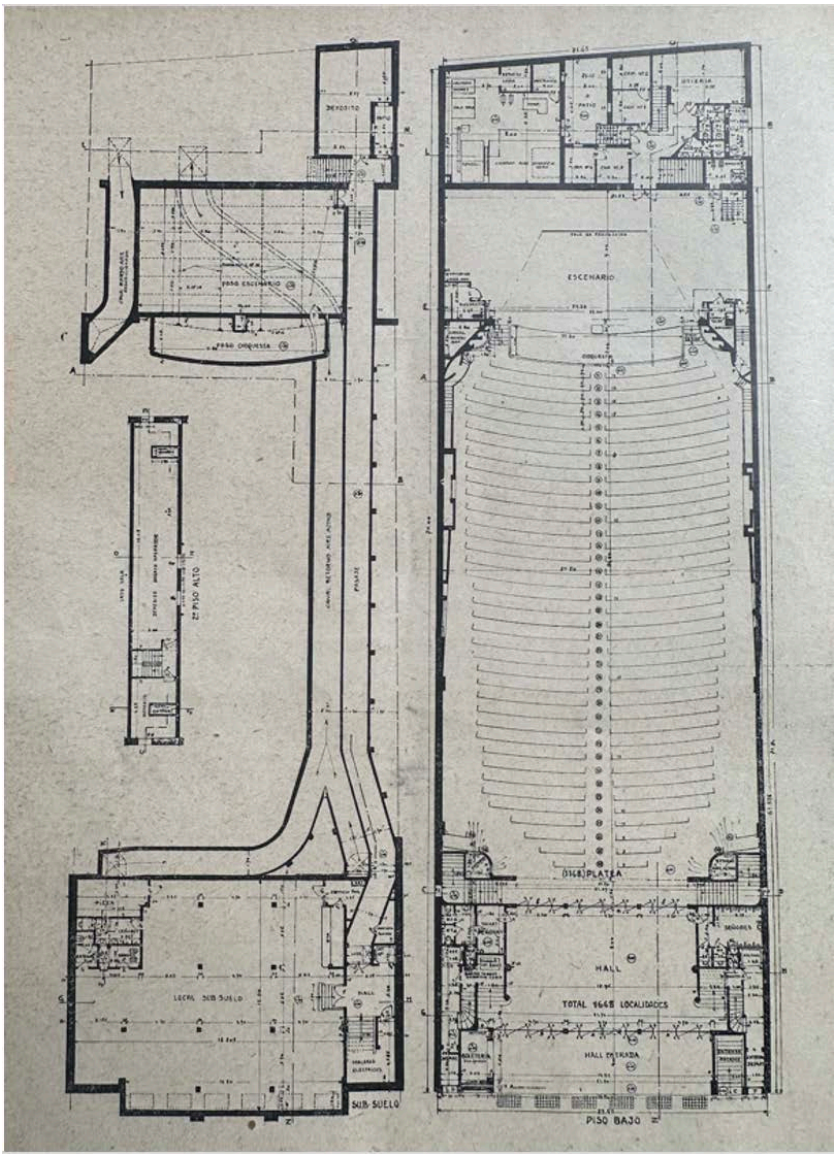

Figure 7. Even with excellent equipment for theatrical functions, the basement and ground floor of the Estornell theater cinema set up the project for the best view of the screen. Source: Bourdon, A. (1994) CACYA Journal

The emerging movie business attracted crowds, leading to the Cervantes cinema opening in 1932 in front of the foundational square**3** (Figure 6). This space was promoted as a performance hall, holding concerts, zarzuelas (Spanish musical theater), and theatrical performances. The building's shape had the technical requirements for cinematographic projection, and its facade and interior decoration style were associated with an Art Deco language. Cinema in San Juan became a phenomenon that inevitably led to the creation of a new type of building with, according to Méndez and García Falcó (2015), an aesthetic avant-garde, that was consummated with architecture, deploying architectural abstractions of modernity" (p. 23).

In 1941, the Estornell family business promoted the expansion of one of the main areas and added a venue for showings, embarking on constructing another hall, encouraged by the film's box office (Figure 6). The project included a hotel, a candy store, and a ballroom, and was led by Alberto

3 This building was not damaged by the 1944 earthquake, but was demolished by the opening of José Ignacio de la Roza Avenue, a new civic-commercial central intersection

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Bourdon. For the first time, according to Vizcaíno (2024), "the second Estornell theater would be promoted under the cinema-theater category" (p. 5). The brand-new room is presumed to balance both activities' spatial and technical requirements. However, the resulting shape shows this followed a cinema format, just like the Cervantes. As the Tribuna Newspaper mentioned on August 21st, 1942, ***the room is for monumental projections,*** detracting from theatrical events. Among its shortcomings are the extreme distance from the stage to the back row, or the almost zero slope, asserting that the main goal was the best possible view of the screen (Figure 7).

Between the two Estornell theaters, it is interesting to highlight how the theater's typology is renewed by its association with the movie business. The newest theater was integrated into a multi-purpose building, in tune with urban changes and commercial challenges. The company repeated the investment in twenty years, building another modernized theater. This showed how the massification of films required specific buildings. Vizcaíno, Garrido, and Bossay (2020) define the cinema as a material legacy that absorbed the rhythms and cultural trends of the contexts where it was implanted. The cinema business differs from the theatrical halls in its dynamics. It maintains the classic canons of representation and accommodates itself in any setting. Despite this, the layout, size, and rooms of the Estornell cinema-theater allowed concerts, ballet, and prose performances. It was consecrated as the official stage for several decades for the provincial galas on commemorative dates.

At this point, the theater-cinema relationship poses a key discussion for the research. As part of the ***type*** idea proposed by Moneo (2004), cinemas in San Juan repeated the same formal structure of theaters- a large dark box- to get the best view of the screen or stage. In fact, did both uses in the same space provoke an erroneous opinion in the people of San Juan to identify the shape of a theater? The interest in reviewing cinema typology, similar to the "absent" theaters, is understood as a memory of the current city. Therefore, and according to Vizcaíno (2021), the similarity that identifies a set of buildings, approximates understanding the reasons that justify these insistences. The interesting thing about this is to recognize that, before the rise of films and their new buildings, the theatrical content held in any field continued to attract viewers. Therefore, theater's meaning and transcendence reside in a network of material relationships, as defined by Waisman (2009), to which the imaginaries of the population are added.

Modernity in the Reconstruction of San Juan

Regarding the historical background analyzed, it is argued that San Juan's history had a point of inflection with the earthquake that struck on January 15th, 1944. This earthquake almost completely razed the buildings, which later motivated the deployment and discussion of a set of proposals that pushed for the definitive reconstruction of the city, which took several years.

Approving an Organized Urban Plan layout took several years of debate and concretization, with many backs-and-forths. For Healey (2012), "the clash of economic and social interests, added to the political fluctuations of the time,

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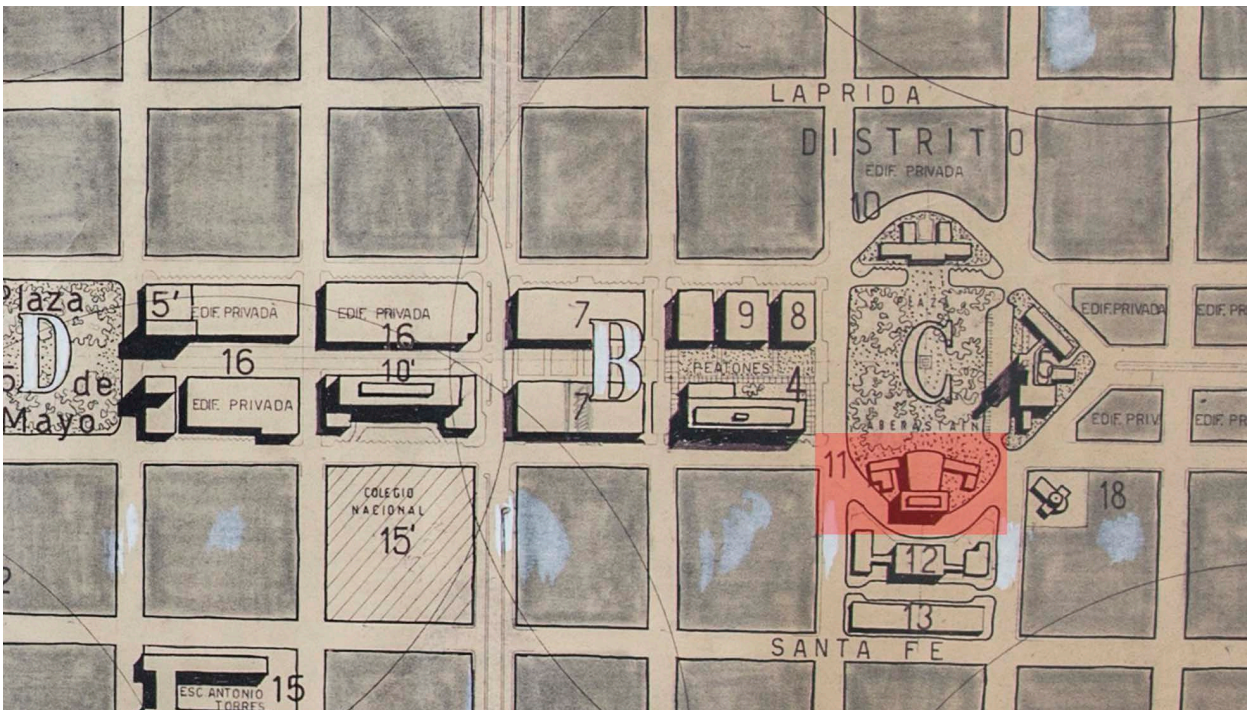

Figure 8. Detail of the Urban District of the Juan José Pastor Architectural Plan (11 is the Auditorium).
Source: Urban History Museum (1948).

and the succession of conflicting reconstruction plans for the city, continues alongside an intertwining with fictitious speed" (p. 103). While Goenaga (2021) defines that "the focus of urbanism was on the demand for new institutions after the transformation of state institutions" (p. 7), it turns out that this strengthened the state's presence in its role of commanding the reconstruction, and, according to Healey, its presence could be extended through its buildings. In the approved Pastor Plan, a Theater for the City resurfaced once more as a necessity, under the name of Municipal Auditorium (Figure 8). The building forms the tip of the new central avenue east of the colonial checkerboard, with municipal offices, a post office, and the neighborhood market; curiously, the denomination and inclusion of "theater" appear only for the design of non-central neighborhoods.

The final Plan did not progress as expected; it was only partially materialized, and the Auditorium was never built. Without an official room, the dependence on organizing and holding government events in private venues ended with the signature of the federal auditor Bernasconi. In April 1958, the Sarmiento Cultural Hall, owned by a primary school, was decreed as the official theater of the Province**4** It met two essential requirements: its size (with more than 1000 seats) and accessibility to the street. The initial remodeling comprised enabling the entrance and the ticket office on Alem Avenue and becoming independent from the educational establishment.

Other alternative spaces

With the opening of more cinemas**5** in San Juan, movies exceeded their average audience. The screening rooms acquired unusual prominence for

4 Although currently the Sarmiento Theater continues to operate under the culture area, the room is identified as part of the Sarmiento Superior School, which covers an entire block.

5 Between 1942 and 1965, 12 movie theaters were built in San Juan, and an equivalent number of open-air cinemas were added, making up the neighborhood's second exhibition circuit.

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the city, becoming a model of a renovating architectural language. Meanwhile, the stage activities attracted a select audience to different spaces smaller than the cinemas, with disparate characteristics.

The local vocational groups regularly used the institutions' assembly halls: Lebanese Syrian Club (Figure 9), Casa España, Franklin Library, and San Juan Bank, which had a sufficiently sized event space, for between 200 and 350 spectators. Unfortunately, these examples were designed with minimal technical conditions: difficult to darken areas, chairs instead of armchairs, shallow stages, and almost no technical support for lighting and scenography. The deficiencies denote a particular bias of having been proposed as spaces for amateur theater, a reason that they failed to inspire, nor did they modify their characteristics to promote outstanding scenography.

Two architects participated in founding two emblematic places for artistic experimentation in texts and montages. In the 1960s, ***El Globito*** stood out (Figure 9). This was a chamber theater with a circular floor plan (a school of puppetry, plastic arts, music, and pantomime worked there). The architects Federico Blanco and Felix Pineda were involved in its construction and the drawing and painting classes taught there**6**. Later, ***El Planario***, owned by the architect and actress Carmen Renard, appeared. This was a house that was remodeled to teach acting workshops and where riskier montages were made, which interested an even more select group of spectators. According to local theater studies, existentialist French texts dominated the schedule. The plays were performed in a space with the audience arranged in a circle or semi-circle, following the adapted Greek theater format.

For some studies conducted on local theater, ***El Globito*** and ***El Planario*** generated the substance of a thematic, learning, and communication change while encouraging the audience to have another version of the theater in a building that had not been built for that. In both cases, their smaller stages modified the distance between the spectators and the actors; consequently, so did the role of the scenography and the costumes, which provided another sense to the scenic event. Like in other cases, the alternative rooms consolidated a network of spaces for the San Juan theater, where creativity was constantly tested.

In other words, commercial theater was linked to figures from Buenos Aires who occasionally disembarked in San Juan, making stops on the traditional tours to the country's interior. With a large audience, these functions took place strictly using the cinemas and the Sarmiento Theater, whose multifunctionality blurred it under the concept of being projected as a school assembly hall.

The great theater

The Bicentennial Theater, whose construction was announced in 2007 and inaugurated on October 21st, 2016, was the product of a process convened by the Provincial Government under the project and price public tender format**7**. This means the award would not necessarily be chosen

6 This is currently the Department of Visual Arts of the Faculty of Philosophy and Letters of the National University of San Juan.

7 Currently, a preliminary project identified as the 2nd prize of the competition for the Bicentennial Theater of San Juan (2011) is displayed on the web, a situation that raises an instance of competition that was never reported as such, nor made public and visible to experts or the San Juan community..

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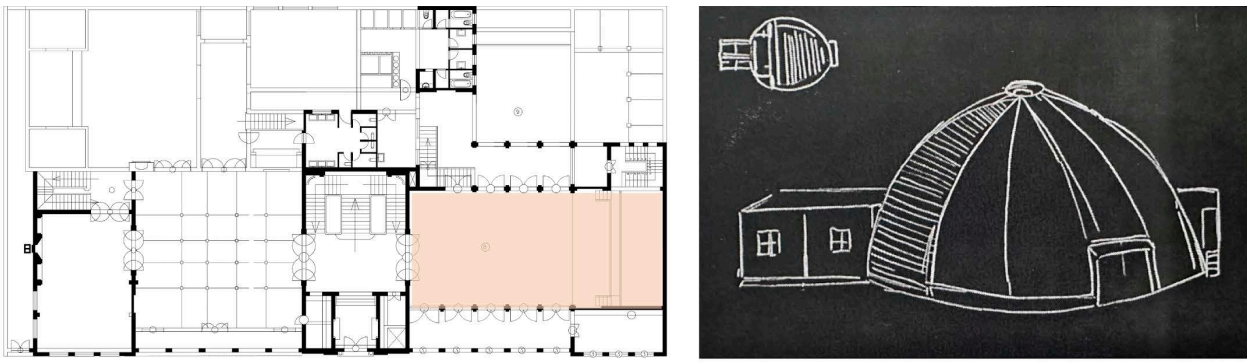

Figure 9. Ground floor of the Lebanese Syrian club (indicating the area of the Assembly Hall) and El Globito, according to the evocative sketch of the director, Oscar Kummel. Source: Writings on the San Juan scene. Alicia Castañeda, 2011.

for the lowest cost or the proposed architecture's quality. In this sense, it is worth asking whether the definitive architectural project was decisive in choosing Panedile Argentina, ICB Construcciones, and Perfil S.R.L. as the winning companies over the other two proposals submitted.

The site chosen to build the theater was on the former San Martin railway station, a large block adjacent to the Civic Center (where most government offices are found). Its presence vindicates the leading monumentality of State architecture and, in a certain way, evokes the hierarchical location of the Auditorium in the Pastor Plan for Reconstruction: a building surrounded by public use space at the tip of a critical urban intersection (Figure 10).

Due to the celebration of the second centenary, this building had very different political circumstances from those of 1910. However, its program and final resolution contain the essence of the Coliseo Theater.

The Bicentennial Theater has a ring shape around an inner courtyard surrounding the room intended for lyrical theater. This urban cloister generates two gardens that attenuate and shelter the extreme heat. In their journey, the walker does not perceive themselves to be abstracted by any formal metaphor or technological boast; they recognize a dominant functionality and, through the set of volumes, identify it as an urban landmark (Figure 11).

As shown, building a lyric theater continued as the purpose and determined the architecture according to the genre. The main hall is in the "Italian style" and can accommodate 1,129 spectators. The opera's demands require a large stage (with a rotating disc 16 meters in diameter), an orchestra pit for 100 musicians, and masking the mobile acoustic diffuser. Inevitably, these qualities are directly associated with ***typology*** because, according to Forty (2000), "this outline replicates the conservative procedure in that functional-types are formal-types" (p. 304). With an independent entrance, on one of the side facades, there is also a smaller room that houses 190 spectators. This Secondary Theater Hall is intended for any performance, from prose to chamber concerts (Figure 12).

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Figure 10. Above, the Bicentennial Theater at the tip of the civic intersection, below, its main facade. Sources: Government of San Juan, 2020a.

CONCLUSIONS

The article presents an unpublished description of the first major theater in the city of San Juan, Los Andes, and from this unfolds a panoramic chronology of an architectural typology installed between 1904 and 2016, at a critical political and cultural moment in the country. After over a century without a theater in this small city (with a density of 9.3 inhabitants per square kilometer), it was finally materialized with the Bicentennial Theater. Only in the 21st century did San Juan's desire for a high-quality hall come to fruition. However, regarding their formal characteristics and theoretical discussion, some special points stand out in a historical review of the spaces that preceded theatrical activity in the city.

Currently, the Bicentennial Theater, as an essentially lyrical theater, seems to sound ***out of time,*** according to Waisman (2009). The rise of the opera, which eclipsed the stages with repertory works of the late 19th century, today maintains a general crossroads to delineate its future worldwide. The need for partnerships with counterparts, such as the Teatro Colón in Buenos Aires or La Plata, reduces the number of performances of this exclusive genre, as do the high costs for a hall like this, which is economically offset by other musical events (recitals and concerts).

From the urban point of view, the monumental scale makes the new Bicentennial Theater a reference that emphasizes the perspective of its location on the longitudinal axis of the land. As for the interior, the lobby's

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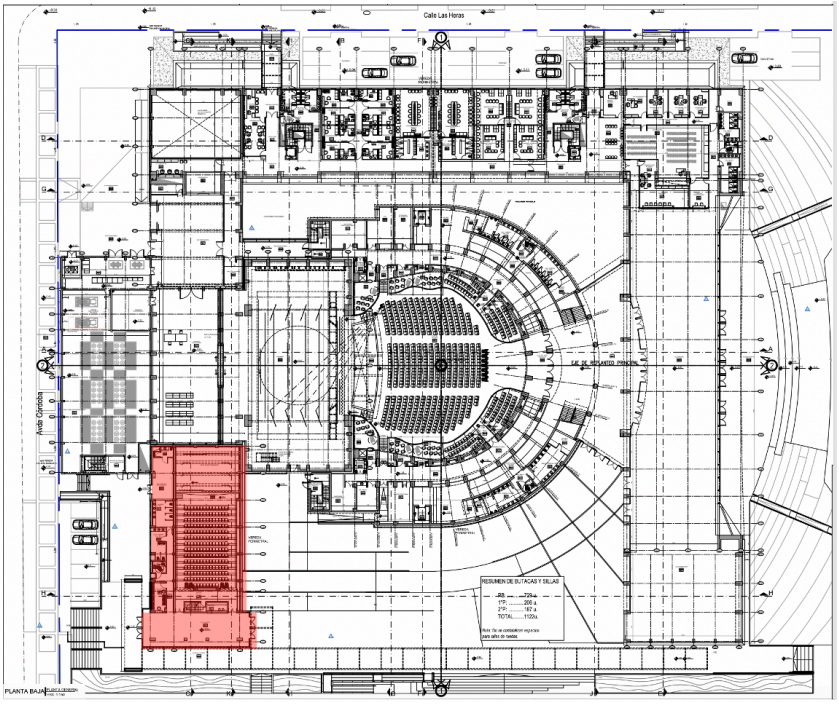

Figure 11. General floor plan of the Bicentennial Theater, and in detail: the 190-person room. Source: Government of San Juan, 2020b.

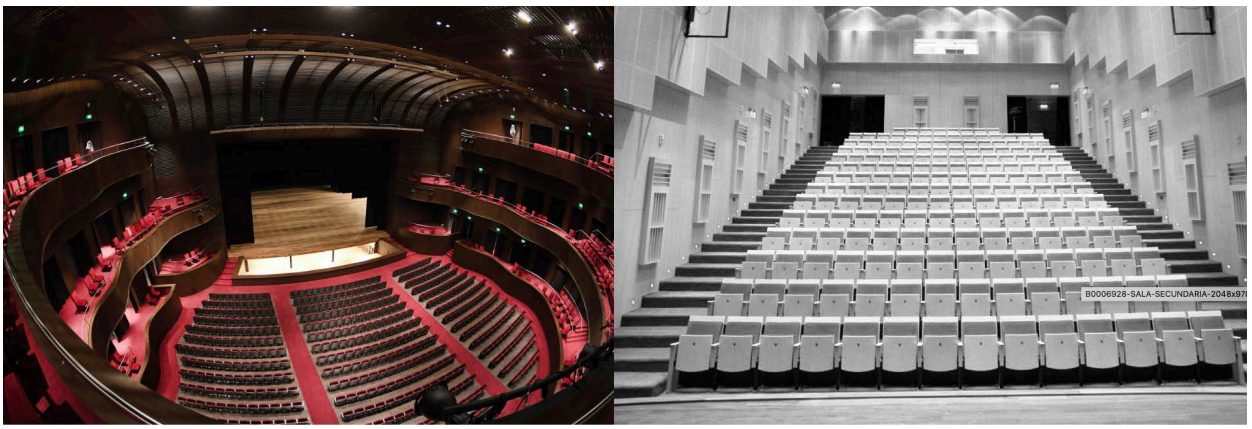

Figure 12. Interiors of the main and secondary halls of the Bicentennial Theater complex. Source: Bicentennial Theater, San Juan. Argentina, 2020.

oversized design does not justify its functionality. The role of being the space that anticipates and prepares to discover the great hall is blurred, as it poses a hierarchical competition between both enclosures.

The reference to out-of-time can be expanded to the form chosen to build the long-awaited San Juan theater, which used the same typology as the Coliseo Theater, which was proposed in 1900. More than a hundred years separate the unbuilt project and the recent work, with a conceptual contradiction, the spatial resolution of the latter, which validates and replicates the "Italian-style" model, interpreting this gesture as a typology that has not evolved, nor adjusted to new times. For example, the balcony layout, some of which are unusable, or the low slope of the stage, which makes it difficult to see the lower stage, raise doubts as to why another format of room, stage, and pit for musicians could not be implemented, more in line with contemporary technologies for live shows.

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The general organization chart in the building minimizes traditional theatrical representation, disposing of a room with a smaller capacity and dimensions that can be functional for any of the scenic genres.

In this sense, it is worth noting that, at the same time, the validity of theatrical presentations in San Juan continues to take place in alternative places for local entertainment**8**, which shows that the public's interest in the theater is maintained and the local casts develop the ability to accommodate the staging according to where the function takes place. Given this, it is worth asking whether, instead of a lyric theater such as the Bicentennial Theater, it would have been more appropriate to build an avant-garde hall or a complex of halls for various theatrical functions, whose typology would have appropriated the most valuable quality of the San Juan theater and that determines its validity: that of spatially adapting anywhere.

8 Currently, there are 10 alternative spaces that accommodate theatrical activity in San Juan.

CRediT AUTHOR CONTRIBUTIONS

Conceptualization, M.V.; Data curation, M.V.; Formal analysis, M. V.; Funding acquisition, M.V.; Research, M.V.; Methodology, M.V.; Project management, M.V.; Resources, M.V.; Software; Supervision; Validation, M.V.; Visualization, M.V.; Writing - original draft, M.V.; Writing - review and edit, M.V.

BIBLIOGRAPHIC REFERENCES

Alicia Castañeda, S. L. (2011). *Escritos sobre la escena sanjuanina: producciones, recepciones, circuitos, San Juan*. Universidad Nacional de San Juan.

Bourdon, A. (enero 1944). Cine-Teatro "Estornell", en San Juan. *CACYA, Revista del Centro de Arquitectos, Constructores de obras y Anexos*, (200), 203-207. https://biblioteca.fadu.uba.ar/catalogo/revistas/pdf.php?f=pdf/files/fb94ffdb38429f9c4e5c550e3f8c0a81.pdf&g=267

CEDODAL. (s.f.). Centro de Documentación de Arquitectura Latinoamericana (CEDOPAL)-25 años. Planos y dibujos de aquitectura rioplatense 1880-1950 [Archvo PDF]. https://bcn.gob.ar/uploads/Catalogo-CEDODALdigital.pdf

Fernández, J. (2001). La sociedad dramático filarmónica una actividad teatral en el San Juan del siglo XIX. En Mariel, J. (Ed.). *Sarmiento y la puesta en escena del siglo XIX* (pp. 14-30). Fundación Ateneo.

Gironés de Sánchez, I. (2005). *LA CIUDAD PERDIDA. Memoria urbana de San Juan Preterremoto 1930-1944*. Facultad de Filosofía, Humanidades y Artes, UNSJ.

Gobierno de San Juan. (2020a). Documentación técnica del proyecto aprobado [Archivo PDF]. https://media.sanjuan8.com/p/3a65af202cd36b8b688bfd105b6b1d63/adjuntos/303/imagenes/009/097/0009097706/1200x0/smart/teatro-del-bicentenariopng.png

Gobierno de San Juan. (2020b). Documentación técnica del proyecto aprobado por DPDU [Archivo PDF].

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ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Forty, A. (2000). Type. En A. Forty (Ed.) *Words and Buildings. A vocabulary of modern architecture* (pp.304-311). Thames & Hudson.

Goenaga, M. (2021). El Plan Pastor (1948) como sistema regional orgánico. *Andinas Revista de Estudios Culturales (10),* 6-19. https://faud.unsj.edu.ar/catalogo-anuario-andinas/

Healey, M. (2012). *El peronismo entre las ruinas: el terremoto y la reconstrucción de San Juan*. Siglo XXI.

Méndez, P. y García Falcó, M. (2012). *Teatro Oficial "Juan de Vera" 1913-2013. Una sala centenaria. Corrientes*, Instituto de Cultura de la Provincia de Corrientes.

Méndez, P. y García Falcó, M. (2015). Pantallas cuyanas. Aportes para un estudio de las salas de cine regionales. *Andinas Revista de Estudios Culturales (4),* 23-37. https://ri.conicet.gov.ar/bitstream/handle/11336/108866/CONICET_Digital_Nro.cba68602-8c6f-4f2c-a638-9ff4a8736296_A.pdf?sequence=2&isAllowed=y

Moneo, R. (2004). Sobre la noción de tipo. En F. Márquez y R. Levene (Eds.) *Rafael Moneo 1967-2004: Antología de urgencia* (584-606). El croquis.

Museo de Historia Urbana. (1948). Municipalidad de la Capital. Archivo Plan Regulador y de Extensión para San Juan, previsto por el Arq. Juan José Pastor en el año 1948 post terremoto del '44. https://www.ipp.faud.unsj.edu.ar/wp-content/uploads/2022/08/9-1-1024x725.jpg

Schmidt, C. (2018). Foyers urbanos: teatros para ópera en el litoral fluvial rioplatense (1852-1908). Un estudio preliminar. *Estudios del Hábitat, 16(2),* e053. https://doi.org/10.24215/24226483e054

Teatro del Bicentenario de San Juan. (2011). *2011_2° PREMIO // CONCURSO TEATRO DEL BICENTENARIO, SAN JUAN*. https://asnnoise.com.ar/concurso-teatro-del-bicentenario/

Teatro del Bicentenario, San Juan. Argentina. (2020). *El Teatro*. https://www.teatrodelbicentenariosanjuan.org/complejoelteatro/

Tusquets, O. (2019). *Pasando a limpio*. Siruela.

Videla, H. (1989). *Historia de San Juan. Tomo IV (ÉPOCA PATRIA 1875-1914)*. Universidad Católica de Cuyo.

Vizcaíno, M., Garrido, C., Bossay, C. (2020). Los cines en Santiago. *Revista de Arquitectura, 25(39),* 6-13. https://doi.org/10.5354/0719-5427.2020.58570

Vizcaíno, M. (2021). *Arquitectura recobrada. Dibujos de un San Juan olvidado*. Universidad Nacional de San Juan.

Vizcaíno, M. (2024). De tipo al hito. El cine-teatro Estornell y la reconstrucción de la ciudad de San Juan, Argentina. *AREA, 30*(2), 1-14. https://www.area.fadu.uba.ar/wp-content/uploads/AREA3002/3002_vizcaino.pdf

Waisman, M. (2009). *El interior de la historia* (2 ed.). Universidad de Concepción.

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MODERNIZATION AND RATIONALISM IN INSTITUTIONAL ARCHITECTURE. THE CASE OF PUBLIC SERVICES AND THE ANTOFAGASTA REGIONAL GOVERNMENT BUILDING, CHILE (1889-1963)

MODERNIZACIÓN Y RACIONALISMO DE LA ARQUITECTURA INSTITUCIONAL. EL CASO DEL EDIFICIO DE LOS SERVICIOS PÚBLICOS E INTENDENCIA DE ANTOFAGASTA, CHILE (1889-1963)

MODERNIZAÇÃO E RACIONALISMO NA ARQUITETURA INSTITUCIONAL. O CASO DO EDIFÍCIO DOS SERVIÇOS PÚBLICOS E INTENDÊNCIA DE ANTOFAGASTA, CHILE (1889-1963)

Figure 0. Public Services and Regional Government Building. Source: Photographic archive of the Directorate of Architecture (1975).

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RESUMEN

El proceso de modernización arquitectónica en Chile, particularmente en la costa del Desierto de Atacama, ha reflejado la transición desde estilos ecléctico hacia los principios del Movimiento Moderno. La Intendencia de Antofagasta, actualmente sede de la Delegación Presidencial Regional y el Gobierno Regional, constituye un caso emblemático de esta evolución. El artículo examina la transformación arquitectónica desde sus inicios en 1889 hasta la edificación moderna inaugurada en 1963, diseñada por Edwin Weil. A través de una metodología historiográfica y el análisis diacrónico de fuentes primarias, principalmente diarios, se identifican tres ejes fundamentales: primero, la evolución del edificio como manifestación de las políticas urbanas y de modernización estatal en el siglo XX; segundo, la reconstrucción del edificio tras el incendio de julio de 1955 como parte de una estrategia estatal para fortalecer la institucionalidad regional, incorporándose criterios arquitectónicos modernos y funcionales; y tercero, el papel de la nueva edificación en la consolidación del centro cívico de Antofagasta, que proyecta una imagen de modernidad y eficiencia administrativa.

Palabras clave: desierto de Atacama, diseño arquitectónico, Edwin Weil, intendencia de Antofagasta, movimiento moderno

ABSTRACT

The process of architectural modernization in Chile, particularly along the coast of the Atacama Desert, has reflected a transition from eclectic styles to the principles of the Modern Movement. The Antofagasta Council Building, now housing the Regional Presidential Delegation and the Regional Government, serves as an emblematic case of this evolution. This article examines the architectural transformation from its origins in 1889 to the modern building inaugurated in 1963, designed by Edwin Weil. Through a historiographical methodology and a diachronic analysis of primary sources, mainly newspapers, three key aspects are identified: first, the building's evolution as a manifestation of urban policies and state modernization in the 20th century; second, the reconstruction of the building after the July 1955 fire as part of a state strategy to strengthen regional institutions, incorporating modern and functional architectural criteria; and third, the role of the new building in consolidating Antofagasta's civic center, projecting an image of modernity and administrative efficiency.

Keywords: Atacama Desert, architectural design, Edwin Weil, Antofagasta council building, modern movement

RESUMO

O processo de modernização arquitetônica no Chile, particularmente na costa do Deserto do Atacama, refletiu a transição de estilos ecléticos para os princípios do Movimento Moderno. A Intendência de Antofagasta, atualmente sede da Delegação Presidencial Regional e do Governo Regional, constitui um caso emblemático dessa evolução. O artigo examina a transformação arquitetônica desde seus primórdios em 1889 até a construção moderna inaugurada em 1963, projetada por Edwin Weil. Por meio de uma metodologia historiográfica e da análise diacrônica de fontes primárias, principalmente jornais, identificam-se três eixos fundamentais: primeiro, a evolução do edifício como manifestação das políticas urbanas e de modernização estatal no século XX; segundo, a reconstrução do edifício após o incêndio de julho de 1955 como parte de uma estratégia estatal para fortalecer a institucionalidade regional, incorporando critérios arquitetônicos modernos e funcionais; e terceiro, o papel da nova edificação na consolidação do centro cívico de Antofagasta, que projeta uma imagem de modernidade e eficiência administrativa.

Palavras-chave: deserto do Atacama, projeto arquitetônico, Edwin Weil, intendência de Antofagasta, movimento moderno

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INTRODUCTION

The construction of institutional buildings in mid-20th-century Chile was not only a response to an administrative need, but also to a profound transformation in how public architecture was conceived. In the case of the Public Services and the Regional Government building, located in the now Region of Antofagasta, Chile, designed after the 1955 fire and inaugurated in 1963, a new structural and conceptual paradigm emerges that marks the transition from eclectic styles to the principles of the Modern Movement, which represents a turning point in the configuration of the city's civic center. Thus, a project that opted for rationality and functionality was reflected. In this context, the Regional Government Building of Antofagasta stands as an emblematic case of how modern architecture not only transformed the urban image but also semiotically consolidated the State's presence in strategic regions of the country.

The project, led by Edwin Weil, National Architecture Prize Winner in 1981, not only sought to provide the city with functional equipment but also embodied a rationalist architectural language characterized by volumetric clarity, formal cleanliness, and the articulation of spaces through a fluid and flexible floor plan. The incorporation of industrial materials, such as reinforced concrete, steel, and glass, along with solutions like the use of pilotis, modular facades, and open spaces, reveals a willingness to design an architecture adapted to desert conditions, while also capable of establishing an active dialogue with its urban and environmental surroundings.

From this perspective, the building under study is not only an outstanding example of the modern legacy on the coast of northern Chile but also a political and cultural artifact that reflects the State's aspirations for modernization. Its analysis allows one to understand how modern institutional architecture was a projectual tool to reorganize the public space, legitimize the state action, and build new ways of inhabiting the urban in tune with modernity.

The article examines the historical and architectural evolution of the building that currently houses the Regional Presidential Delegation (DPR, in Spanish) and the Regional Government (GORE, in Spanish). From its initial version at the end of the 19th century to the inauguration of its current structure in 1963, this building represents a remarkable example of the architecture of the Modern Movement. The analysis highlights how its design responds to the need to adapt government buildings to the principles of efficiency and functionality typical of architectural rationalism.

Thus, three hypotheses are posed. The first says that the architectural evolution of the institutional building reflects the changes in urban policies and the modernization of the State in the mid-20th century, which manifests a paradigm shift from eclectic architecture to the rationalist principles of the Modern Movement. A second hypothesis states that the reconstruction of the building after the 1955 fire is part

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of a state strategy to strengthen regional institutions, which incorporates modern architectural criteria that respond to functional needs and a discourse of renovation and progress. Lastly, it is posed that the location and contemporary design of the building have played a key role in consolidating the civic center of Antofagasta by creating a space for the representation of political and administrative power in the region.

THEORETICAL FRAMEWORK

The architecture of the Modern Movement, characterized by the reaction to tradition and decorative and artistic conventions, became the projection of functional, rational, and minimalist approaches in buildings (Norberg-Schulz, 2009; Frampton, 2020). Thus, its development in Chile, from the 1920s to the 1950s, significantly influenced the country's institutional architecture, especially in the north, aligning with the state's modernization policies, which promoted a sober, efficient, and representative public architecture of institutional progress (Galaz-Mandakovic, 2019; Galaz-Mandakovic, 2020; Valenzuela, 2024).

This movement promoted rationalist designs that emphasized functionality and operability as structuring principles that were reflected in the projection of state buildings, inscribed in an era of crucial transformations in the coastal city, where a set of rationalist buildings unveiled a modernization process, such as hospitals, residential buildings, hotels, schools, etc., whose structures and designs represent the integration of modern principles adapted to the local environment. In that context, different architects operated "in forming a laboratory where proposals were developed in various desert environments, aimed at societies receptive to the new architecture and the renovation that accompanied it" (Galeno, 2008, p. 18). In this way, modernity facilitated experimentation to address "those particularities of the desert" (Valenzuela, 2024, p.68).

Institutional buildings play a crucial role in shaping and consolidating urban civic centers. Urban studies, such as those by Jan Gehl (2013), document how these institutional buildings act as milestones that organize a region's administrative and social life. The Regional Government Building of Antofagasta exemplifies this phenomenon by serving as a focal point in the administrative organization and reinforcing the state's presence in northern Chile. Thus, the value of these buildings lies in the fact that "A man does not inhabit only his own house, he also 'inhabits' when he participates in a community, and the institution makes that participation possible" (Norberg-Schulz, 2009, p.127). Namely, when an institution is established in a public building, the inhabitant experiences a sense of belonging, as well as a sense of participation. The purpose of modern architecture is to create spaces that foster contemporary life and also project a rational vision of a city.

The building under study is inscribed significantly in the national and international history of the architecture of the Modern Movement,

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as it represents a situated translation of the rationalist principles that dominated 20th century state architecture, which established a clear link with the international currents of architectural modernism, such as those promoted by Le Corbusier or the CIAM (Corbusier, 2007; Frampton, 2020). However, its value also lies in the local reinterpretation of these postulates, adapted to the environmental conditions of the coastal desert of northern Chile through bioclimatic strategies (Olgyay, 2015; Garzón, 2021) and a functional spatiality that responds to the regional scale. In the Latin American context, the building dialogues with other modernist experiences promoted by the developmental states of the period, such as Niemeyer's Brasilia or the state ensembles of Cardenistan's Mexico (Liernur, 2001; López-Durán, 2018), but on an intermediate scale that articulates institutional centralization with climatic and urban appropriation. Thus, this work not only testifies to the adoption of a modern architectural language, but also its resignification in a peripheral environment, which consolidates Antofagasta as a node of administrative modernity and projects an image of progress and rationality that transcends the merely stylistic to acquire its own political and cultural density (Norberg-Schulz, 2009).

METHODOLOGY

The approach of this study applies a historiographic methodology by collecting and analyzing data from unpublished primary sources. For this purpose, the local historical press, parliamentary acts, plans, and photographic archives are evaluated from a diachronic perspective. In this way, these are combined with architectural analysis, a description, and a comparative examination of the different buildings from 1889 to 1963. This methodology allows a detailed chronological outline that evaluates the design decisions and materials used at each stage of the construction. In this sense, the consolidation of the modern building responds to administrative needs and symbolizes the State agency's efforts to strengthen its legitimacy in the region and project an image of modern innovation.

CASE STUDY

HISTORICAL EVOLUTION OF THE INSTITUTIONAL BUILDING

The history of the Regional Government Building of Antofagasta is marked by a series of milestones that reflect not only the administrative and urban evolution, but also the transformation of materiality, from the acquisition and adaptation of a first building in 1889, to the construction of a more imposing building in 1909. However, its fate changed drastically with the 1955 fire, which completely destroyed it, forging an urgent need for a new building. The following is a brief historical diachrony that inscribes and contextualizes the construction landmark inaugurated in 1963.

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First Regional Government Building of Antofagasta (1889)

Once the War of the Pacific ended, Antofagasta ceased to be a Bolivian city and became a Chilean one. On July 12th, 1888, the creation of the Province of Antofagasta was formalized, and the demand for a building for its work was included (Ardiles Vega, 2005).

In this context, the State acquired a property belonging to the Company, Minas Descubridoras de Caracoles. However, the building was not fit for purpose, as it had structural, sanitation, and overcrowding problems. Faced with this situation, it was proposed to relocate the institution to an existing building on the corner of Prat and San Martín Streets, where an old wooden structure would be remodeled. The repair works were conducted by Anastasio Fuenzalida's company, with a total cost of $18,221.16 (Ardiles Vega, 2005, p. 38).

From March 1889, the Province's Regional Government Building was located in the heart of the city, in front of Colón Square, constituting a milestone in regional management and the consolidation of a civic center in the context of the Chileanizing process of a region invaded in 1879 (Galaz-Mandakovic, 2018).

Construction of the second building (1909) and fire (1955)

Due to the building's anachronism, construction on a new institutional building began in 1909 within the framework of preparing for the Republic's Centenary. The architect Leonello Bottacci, General Director of Public Works, who stood out for conceiving institutional buildings that "coincided with the period of urban consolidation" (Galeno, 2014, p. 63), was responsible for the design. Thus, a French-influenced style stands out in the projection, "[...] large roofs and mansards crowned the new eclectic institutional architecture [...] his designs proposed an architecture that forged a cosmopolitan urban space, of great size, ambitious and attentive to trends" (Galeno, 2014, p. 64). The work was revised by Emile Doyere and built by Jaime Pedrany (Galeno, 2014).

By 1909, it was reported that, "In the previous quarter, all the foundations and half of the partitions of the first floor were completed, half has been completed to date" (El Mercurio de Valparaíso, August 31st, 1909, p.5). The building occupied a corner and was organized around two courtyards. It had a first floor of 2,824 square meters. The second floor had 1,276 square meters and was used as a residence for the Governor (Recabarren Rojas, 2003, p. 176).

After 45 years as the most important administrative center in the Atacama Desert, the building burned down rapidly in the early morning of July 16th, 1955, due to the lack of maintenance in the electrical installations: "it was a fire of immense proportions" (El Mercurio de Antofagasta, July 16th, 1955a, p. 1).

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Figure 1. The Regional Government Building of Antofagasta was built in 1909. With an eclectic profile with French influences, a symmetrical facade with equidistant windows highlights a straight mansard and balcony with balustrades in the center of the building and decorative cornices and moldings. Source: The author's files.

EL MERCURIO
DE ANTOFAGASTA

Fundado el 16 de Diciembre de 1906

PRECIO: DIEZ PESOS ($ 10.—)

Antofagasta, sábado 16 de julio de 1955

Nº 17.108

Izquierda, aspecto que presentaba el fuego en el edificio de la Intendencia a las 5.30 de la madrugada: las llamas alcanzaban enorme altura. Derecha, el edificio tal como quedó después del incendio. Con todos sus departamentos totalmente destruidos, ofrece un frontis casi intacto, por la calle San Martín y destruido parcialmente por Prat. Tres horas y media duró el fuego.

EL EDIFICIO DE LA INTENDENCIA QUEDO PRACTICAMENTE DESTRUIDO; EN CIEN MILLONES DE PESOS FUERON AVALUADAS LAS PERDIDAS CAUSADAS POR INCENDIO

Quedaron sin oficinas la Intendencia y su Secretaría, la Inspección y el Juzgado del Trabajo, Reclutamiento, Vialidad, Notaría Galleguillos y otros servicios

Figure 2. Headline of the newspaper El Mercurio de Antofagasta, July 16th, 1955a. Source: Author's files.

The newspaper added:

> "The interior partitions of cane and clay, and the paint, still fresh from the front, burnt easily, fueling the bonfire it provided to the gathering crowd [...] an impressive spectacle. Gigantic flames and columns of smoke were rising, which could be seen from all points of the city" (El Mercurio de Antofagasta, July 16th, 1955, p. 1).

Due to the effect of the incident, the Provincial Architect Alejandro Crestá pointed out that it was a complete loss. The approximate estimates

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Figure 3. A vacant lot arose once the damaged property was demolished. Source: Author's files.

of the losses were close to 100 million pesos (La Nación, July 19th, 1955, p.6). The Highways office declared that plans and documents, in addition to transmitters, calculating machines, two adding machines, nine typewriters, etc., were lost. "A new building must be built," added the architect Crestá (El Mercurio de Antofagasta, July 16th, 1955b, p. 1) (Figure 1, Figure 2, and Figure 3).

The Requirement of a new property

"We must obtain from the government the construction of a new building," was the headline of the newspaper El Mercurio de Antofagasta, which quoted the statement of Governor Juan Lacassie. It added: "This constitutes a serious loss that must be overcome [...] the State loses, on this occasion, very valuable furniture and real estate" (El Mercurio de Antofagasta, July 16, 1955b, p.2).

Juan Lacassie indicated:

> "[...] we will try to make the most for the city of Antofagasta, trying to get the government to consider, on the grounds of the former Regional Government Building, a modern building that brings together all the public offices of the city, something for Antofagasta to be proud of" (El Mercurio de Antofagasta, July 16, 1955b, p.2).

A few days after the fire, "Studies to build a new building" were announced (El Mercurio de Antofagasta, July 17th, 1955, p.1). As soon

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EL MERCURIO
DE ANTOFAGASTA
M. R.
Antofagasta, miércoles 3 de agosto de 1955

co será
e plazo
ESPUES DE LAS
LA CORFO
los bonos respecti-
les hizo presente
necesidad de resol-
blema de energía
ara Antofagasta y,
les manifestó que,
la única medida de
que podría traer
para el mal servi-
e, era el aprovecha-
la energía eléctrica
rán dos motores ad-
r la Fuerza Aérea
rvicio de la Base
erro Moreno, conec-
r medio de líneas de
n al servicio de la
unión antes referida,
que los Diputados
ücher y Ramón Sil-
mpañaran a conver-
Gerente de la Cor-

JEFE DEL ESTADO DESEA QUE NUEVO EDIFICIO DE LA INTENDENCIA CONCENTRE OFICINAS PUBLICAS

ASI NOS INFORMO EL INTENDENTE.— AGREGO QUE SE DARAN ORDENES PRECISAS PARA INICIAR CUANTO ANTES LA CONSTRUCCION.— SE CONTARA CON PERSONAL TECNICO Y LOS ELEMENTOS NECESARIOS PARA PLANIFICAR Y DIRIGIR LOS TRABAJOS

De diversos problemas de la provincia se ocupó en la capital el Intendente señor Juan Lacassie Arriagada, quien regresó anteayer. Solicitó la solución de los más urgentes, tales como la energía eléctrica y el agua potable para Antofagasta, el alumbrado para Taltal, el abastecimiento de artículos esenciales, y de otros de interés.

NUEVO EDIFICIO PARA LA INTENDENCIA

El señor Lacassie se preocupó también en forma especial de tratar todo lo relacionado con la construcción del nuevo edificio para la Intendencia. Al respecto nos dijo:

Particularmente, en relación con el incendio de la Intendencia, informé en detalle a S. E. el Presidente de la República, y le manifesté el sentir de la provincia de Antofagasta de ver cuanto antes la iniciación de la construcción de un nuevo edificio que diera cabida a las oficinas de la Intendencia, casa-habitación del Intendente y diferentes servicios públicos.

"S. E. me expresó que esto se haría a la bre-

"Debo expresar a los habitantes de Antofagasta, que mis propósitos fueron ampliamente compartidos por S. E., manifestándome que podía contar con todo su apoyo y que daría órdenes precisas al Ministerio respectivo para que se procediera cuanto antes a hacer una realidad esta nueva construcción que impulsará notablemente el progreso de nuestra ciudad.

"Luego de estudiar detenidamente con S. E. y con el Sr. Ministro de Obras Públicas, la futura edificación de la Intendencia y con el objeto de asegurar el pronto despacho de la ley que otorgará los recursos para su construcción, me puse en contacto con los representantes parlamentarios de la provincia, para cuyo efecto pedí al H. senador y Presidente del Senado, don Fernando Alessandri, que convocara a su despacho a una reunión con los senadores y diputados de la Zona, a la que también concurrió el Intendente que habla. Asistieron a esta reunión todos los parlamentarios que se encontraban en Santiago y ellos fueron los senadores señores Fernando Alessandri, Salvador Allende, Marcial Mora, Guillermo Izquierdo, y los diputados señores Hernán Brücher, Pedro Cisternas y Ramón Silva Ulloa.

"Les expuse a los señores parlamentarios lo que la provincia esperaba de ellos, sobre la nueva construcción de la Intendencia y, por unanimidad, expresaron que, con mucho agrado, me ayudarían en todo lo que les solicitara, poniendo de relieve la satisfacción que les producía el hecho de que por primera vez un Intendente tomaba

Figure 4. El Mercurio de Antofagasta, August 3rd, 1955. Source: Author's files.

as the Minister of Public Works, Alejandro Schwerter, became aware of the fire, he arranged for the Provincial Architect, Miguel Zuviv, to submit a comprehensive report on the incident, thereby identifying what was urgently needed to restore normal office operations. At the same time, the arrival of another modern architect was promised to collaborate in the study for a new building, and thus, "present a project to build a modern building that brings together all the services that do not have premises" (El Mercurio de Antofagasta, July 17th, 1955, p. 1). They were talking about Edwin Weil.

Governor Lacassie said: "I will talk to all the parliamentarians in this area and knock on all the doors necessary so that construction on the new public building starts as soon as possible" (El Mercurio de Antofagasta, July 19th, 1955, p.1). Subsequently, he pointed out that President Carlos Ibáñez had given him direct supervision of project management to avoid consultations at a central level in Santiago, in addition to offering the Provincial Office of Architecture, the technical staff and the elements needed to plan and direct the construction (El Mercurio de Antofagasta, August 3rd, 1955, p.1).

In this sense, the first hypothesis is demonstrated: the architectural evolution of the institutional building reflects the changes in urban policy projections and the modernization of the State in the mid-20th century, manifesting a paradigm shift from eclectic architecture to the rationalist principles of the Modern Movement. All this occurred in the context of discussion and preparation of the Regulatory Plan, initially approved in

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QUE SE CONSTRUYA NUEVO EDIFICIO PARA INTENDENCIA PEDIRA EL SR. SCHWERTER

EL MINISTRO DE OBRAS ASI LO INFORMO AYER AL INTENDENTE

Durante tres horas, el Ministro de Obras Públicas, señor Alejandro Schwerter, visitó ayer las diversas obras que tienen relación con su cargo.

A las 8.45 a. m., acompañado del Intendente, señor Juan Lacassie y de los Ayudantes Capitanes Juan Palma y Teniente Orlando Valenzuela visitó el edificio de la Intendencia que el viernes pasado fué destruido por un incendio. En seguida se constituyó en el local que ocupó el Registro Civil. El señor Schwerter expresó que llegando a la capital emitirá un informe al Gobierno sobre los daños causados por el incendio y solicitará la construcción de un nuevo edificio.

En los terrenos del "Esmeralda"

Posteriormente, el Secretario de Estado y sus acompañantes, más el General René Vidal, el Comandante Luis Carvajal y el arquitecto de la Primera División señor Jorge Tarbuskovic y funcionarios de obras públicas se trasladó a los terrenos donde se construirá el nuevo cuartel del Regimiento "Esmeralda". Allí el General Vidal y el arquitecto Tarbuskovic lo

El Ministro de Obras Públicas señor Alejandro Schwerter, acompañado por el Intendente señor Juan Lacassie, por su Secretario señor Manuel Arroyo y por sus ayudantes Capitán Juan Palma y Teniente Orlando Valenzuela, recorre el edificio de la Intendencia que fué destruído

Figure 5. El Mercurio de Antofagasta, July 22nd, 1955. Source: Author's files.

El grabado representa el proyecto del edificio de los Servicios Públicos. En el segundo piso destinado a la Intendencia y con vista a calle Prat se puede observar un balcón saliente para los oradores. En el primer piso, siempre por calle Prat, se ubicará a la Notaría Provincial (extremo derecho). La entrada principal se encuentra debajo del balcón saliente. En el extremo izquierdo del grabado (primer piso) estarán ubicadas las oficinas de la Tesorería Provincial, con grandes ventanales con vista a calle San Martín

18 REPARTICIONES FUNCIONARAN EN EL EDIFICIO DE SERVICIOS PUBLICOS

Figure 6. El Mercurio de Antofagasta, June 2nd, 1958. Source: The author's files.

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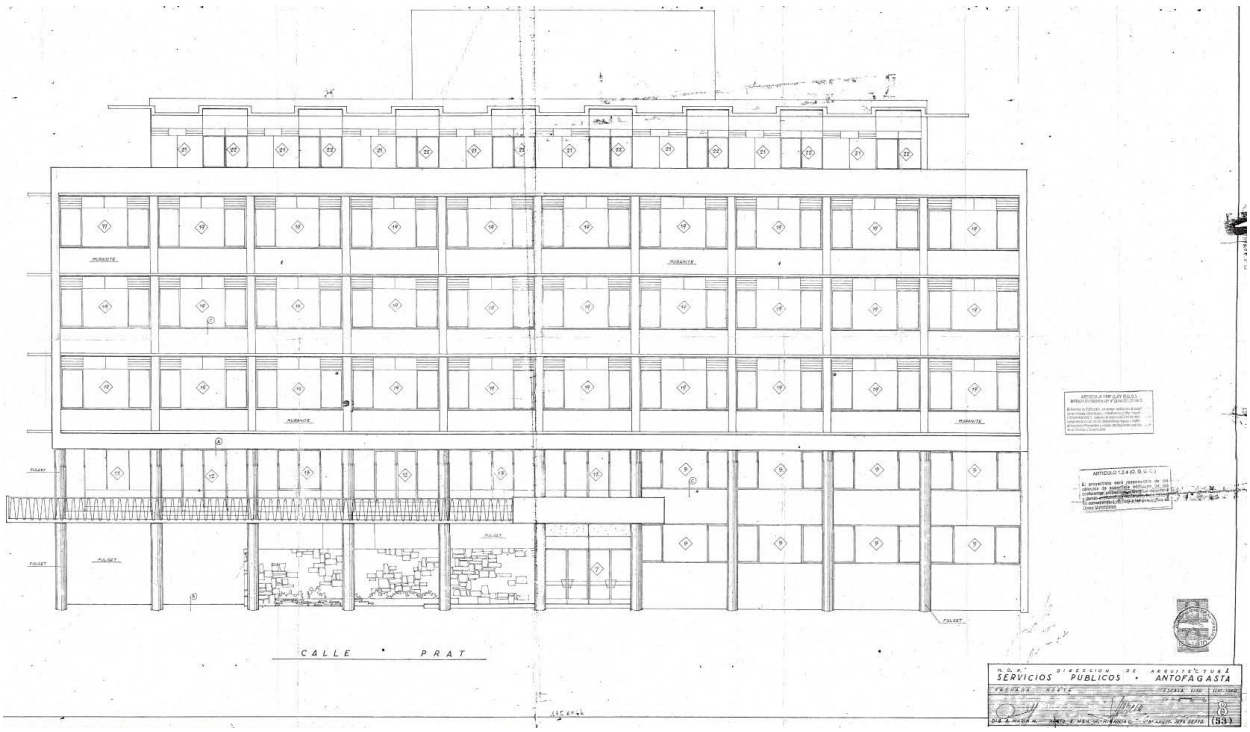

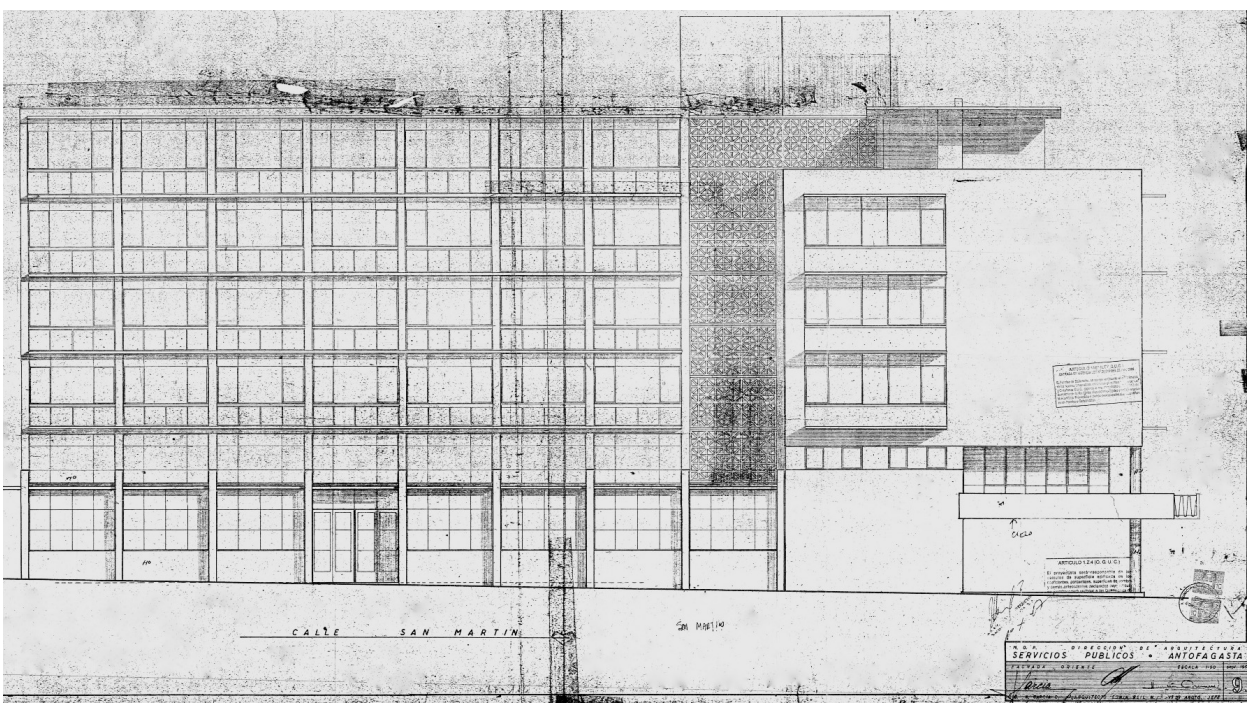

Figure 7. Prat Street facade, designed by Edwin Weil for the Public Services and Regional Government Building of Antofagasta, 1957. Source: Regional Technical Office of the Council of National Monuments of Antofagasta (2020).

Figure 8. Facade San Martin Street, 1957. Source: Regional Technical Office of the Council of National Monuments of Antofagasta (2020).

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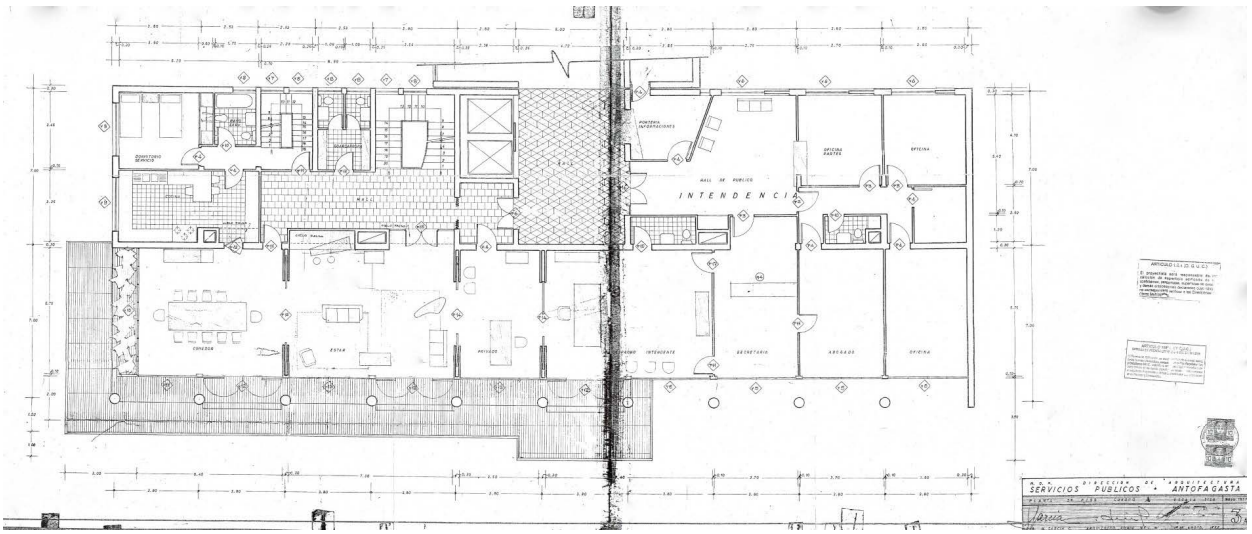

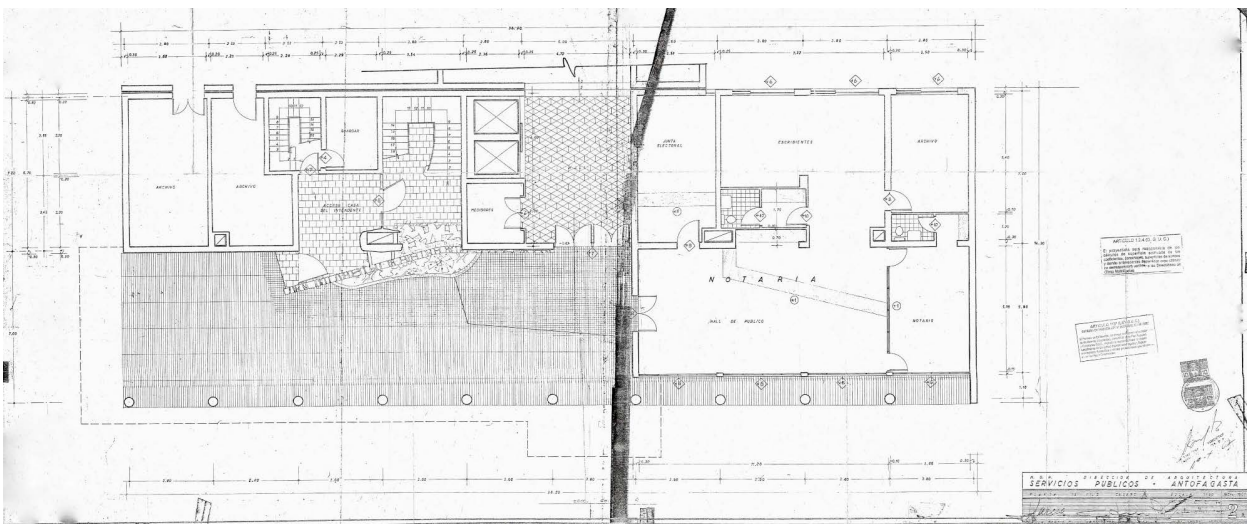

April 1958 (El Mercurio de Antofagasta, April 20th, 1958, p. 1), alongside the foundation of other buildings in the city that were also exponents of the Modern Movement (Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, Figure 10, and Figure 11).

Regarding the design published in the newspaper (Figure 6), we can note that it is a watercolor painting that represents the original design ideal, which was not fully materialized due to modifications in the institutional programs during the project's execution, as well as budgetary pressures and technical constraints that necessitated adjustments to the design. When comparing this proposal with the building finally built, it is evident, for example, that the original plan included a projecting balcony on the second floor, designed for protocol acts of the Regional Government. In the final project, this balcony was simplified and replaced by a smaller canopy that protects the main access, which implied the loss of its ceremonial and symbolic character.

Figure 9. Second floor of the Public Services and Regional Government Building of Antofagasta, 1957. Source: Regional Technical Office of the Council of National Monuments of Antofagasta (2020).

Figure 10. First floor of the Public Services and Regional Government Building of Antofagasta, 1957. Source: Regional Technical Office of the Council of National Monuments of Antofagasta (2020).

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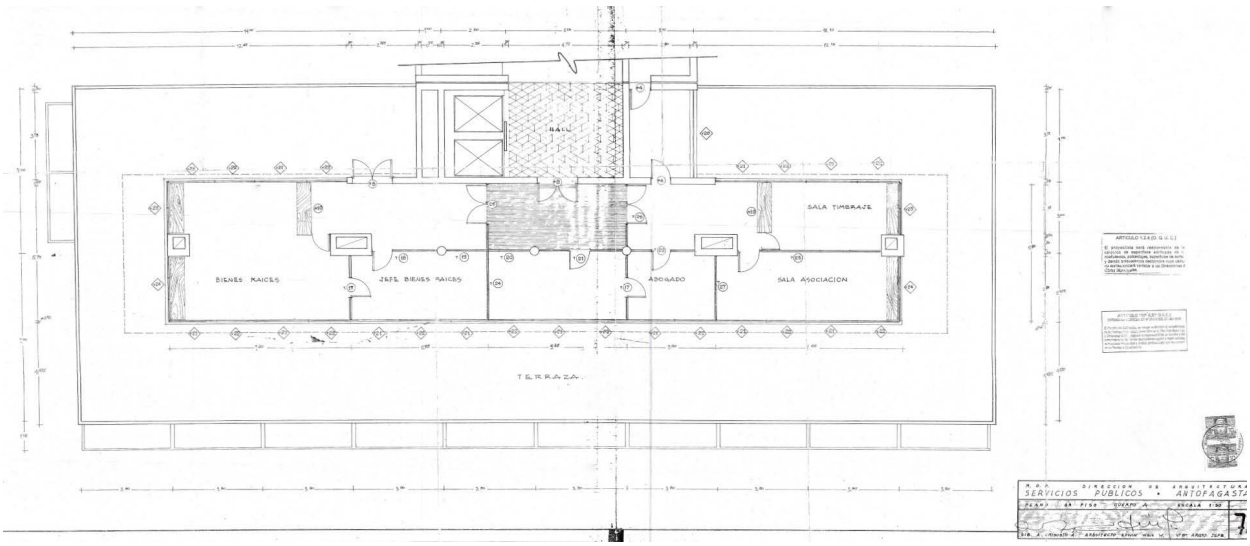

Figure 11. Terrace of the Public Services and Regional Government Building of Antofagasta, 1957. Source: Regional Technical Office of the Council of National Monuments of Antofagasta (2020).

The watercolor shows a more accentuated modulation of the facade's compositional rhythm through a structural grid, balconies, and latticework, elements that imprint dynamism and depth. In contrast, the constructed building favored a more regular composition, with windows arranged in a uniform rhythm, dispensing with protruding balconies or shading devices such as latticework.

The original proposal clearly framed the main access under the balcony, which generated a transition space covered with a strong symbolic load. On the other hand, the entrance lacks an obvious architectural hierarchy in the executed building, significantly reducing the institutional gesture proposed in the initial design.

DEVELOPMENT

CONSTRUCTION OF THE PUBLIC SERVICES AND REGIONAL GOVERNMENT BUILDING (1956-1963)

At the 9th Ordinary Session of the Senate of the Republic, held on April 17th, 1956, the report of the Public Works Commission was read, which recommended the construction of the Municipal building and other public offices (Senate, 1956). The recommendation was based on the resources provided to the Ministry of Public Works through Law No. 11,828. It should be noted that this law established a ***new deal*** for large-scale copper mining. Article 33 provided for the existence of a special account at the Central Bank of Chile in which 9% of the taxes destined for the Ministry of Public Works were deposited.

According to the minutes: "[...] It is therefore urgent to erect a new building to house the various public offices that are currently in unsuitable premises" (Senate, 1956, p.435). However, there was a delay in the start of the works, which encouraged the written press to urge that the project be expedited. Hence, uneasiness generated a cover page for the

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El Mercurio de Antofagasta newspaper (February 5th, 1958), exhibiting a noticeable contrast between the two corners in front of Colón Square.

The newspaper noted:

> "The fire that created this new problem occurred early on July 15th, 1955. Since then, two and a half years have passed, and many efforts have been made to allocate the funds. However, nothing has been done, except for the usual promises (El Mercurio de Antofagasta, February 5th, 1958, p. 1).

The next day, the same newspaper published the final project, drawn up by the architect Edwin Weil, who had been working in the Architecture Directorate of the Ministry of Public Works since 1947.

It should be noted that Weil was trained at the University of Chile's School of Architecture, where he began his teaching career in 1949, combining his academic work with an outstanding professional career in the public sphere. Among his most notable works are the La Serena Regional Government Building (1950) and the reconstruction of Valdivia following the devastating 1960 earthquake. In addition, he played a leading role in expanding stadiums for the 1962 World Cup and was the author of important buildings such as the Central Bank of Puerto Montt and the Civic Center of Punta Arenas. His work was recognized in multiple public competitions and awards, which consolidated his prestige within the field of state architecture. He served as Director of Architecture between 1962 and 1971, and again in 1977 (College of Architects of Chile, 2020, pp. 136-147)

Thanks to his proposal, the building planned in Antofagasta would allow 18 public divisions to be combined into a single architectural ensemble. This ensemble would integrate institutional functionality and spatial rationality under a modern approach to urban space management. This vision responded to the logic of administrative centralization typical of public infrastructure policies promoted in Chile during the mid-20th century (Table 1).

Table 1: List of the divisions considered in the Public Services and Regional Government building projection. Source: Preparation by the author based on El Mercurio de Antofagasta, February 6th, 1958, p.1.

Public Services	
Department of Livestock and Animal Health	Zonal Direction of Urban Paving
Management of Railway Works	Directorate-General of Internal Revenue
Recruitment Office	Provincial Delegation of Supplies and Prices
Fishing and Hunting Inspection	Provincial Labor Inspectorate
Notary Public of the Treasury	IDs and Passports
Labor Court	Civil Registry
Ropero del Pueblo (The People's Wardrobe)	Delegation of Electric and Gas Services
Provincial Treasury	Judicial Tax Collection Service
National Foreign Trade Council	Provincial Legal Division

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According to the Provincial Architect, Miguel Zuvic, the building would have an "A" body facing Prat Street and a "B" body perpendicular to the first and overlooking San Martín Street. Body "A" would consist of 6 floors and terraces, where the Council Office would be located and would occupy the entire second floor. The "B" body would consist of 5 floors and an underground level.

The rough work considered slabs of mezzanines, perimeter walls, pillars, resistant internal walls, elevator shafts, stairs, and ventilation shafts for the different offices' bathrooms. Each office was projected in isolation, through light and soundproof glass partitions. The foundations would require 351 cubic meters of debris extraction, with a calculated volume of 3,580 m³. In brick masonry works, 2,360 m³ would be used, while in reinforced concrete works, 2,143 m³ would be used. Additionally, 198,385 kilograms of iron would be used, with an estimated investment of 56 million pesos (El Mercurio de Antofagasta, February 6th, 1958, p. 1).

The offices were designed to be joined through sliding doors, "transforming into spacious halls for occasional gatherings. The floor destined for the Governor's residence will be spacious and have an apartment for guests" (El Mercurio de Antofagasta, February 6th, 1958, p. 1).

The company awarded the works was the firm Domingo Matte, with an official budget of $141,639,501 pesos (El Mercurio de Antofagasta, March 12th, 1958, p. 1). The same newspaper indicated in May 1958:

> "198 tons of iron will be used in the rough work [...] metal molds will be used in the construction of walls, which will avoid stucco and will make the work run more quickly and with the consequent savings" (El Mercurio de Antofagasta, May 24th, 1958, p.1).

On the details of the building, where 70 workers worked, it was pointed out that:

> "[...] it will have modern architectural lines and will have comfortable offices with all services for all the public offices that are scattered, thereby facilitating a better service to the Antofagastinos, who will be able to carry out their errands more quickly" (El Mercurio de Antofagasta, May 24th, 1958, p.1).

In December 1958, the rise of six columns of the so-called "A" body was noted. The local newspaper mentioned:

> "During our visit to the works, we verified that the excavations of both bodies are about to be completed. The excavations of the 'A' have 70% of their foundations. Practically, the work is not appreciated because it has been carried out underground, but it is of great importance" (El Mercurio de Antofagasta, December 11th, 1958, p. 1).

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Progress was also being made in constructing reinforced walls on the first floor of the "A" body and the concrete columns of Prat Street, which would give shape to a covered entrance. This would allow the sidewalk to extend into the building, resulting in a 10-meter-wide sidewalk in front of the main entrance (El Mercurio de Antofagasta, December 11th, 1958, p. 1).

In September 1959, it was commented that:

> "[...] we were struck in the "B" body by a large-scale underground level, 450 square meters for the parking of state vehicles and a storage area. It is estimated that this level will be the largest in a building in Antofagasta. The great hall for work and public attention of the future Treasury is equally impressive [...]" (El Mercurio de Antofagasta, September 17th, 1959, p.1).

In April 1960, the building had already acquired a definitive form: "A new construction of modern architectural lines with sufficient offices to contain almost all the State services [...] that will contribute to forming a true civic neighborhood in Antofagasta" (El Mercurio de Antofagasta, April 23rd, 1960, p. 1).

On August 6th, 1963, the temporary perimeter fence installed while the Municipal Building was being built was removed. "The new building, with elegant architectural lines, has been admired in all its perspectives by the public, especially on its ground floor, which occupies the closure" (El Mercurio de Antofagasta, August 7th, 1963, p. 1).

The new Municipal Building was considered an urban development advance for the center of Antofagasta, which improved the surroundings of Colón Square and, above all, was important for Public Services "that had been operating in precarious material conditions, in narrow and unhygienic premises" (El Mercurio de Antofagasta, November 3rd, 1963, p. 1).

The building was inaugurated on Saturday, November 16th, 1963, at 11:00 am. Several authorities attended the event, including three undersecretaries (Interior, Public Works, and Agriculture), the Governor of Coquimbo, and other prominent political figures, such as deputies and a senator. Representatives of the Police, agricultural and municipal advisers, and the director of a publishing house also attended. The presence of the architect Edwin Weil, author of the building project, stood out, as reported by El Mercurio de Antofagasta (November 16th, 1963).

Finally, we can identify the three intendants involved in managing the construction process: Juan Lacassie, Justo Pastor Martín, and Néstor Del Fierro.

The described process demonstrates the second hypothesis, in that the reconstruction of the building after the fire of 1955 is part of a state strategy to strengthen regional institutionality, which incorporates

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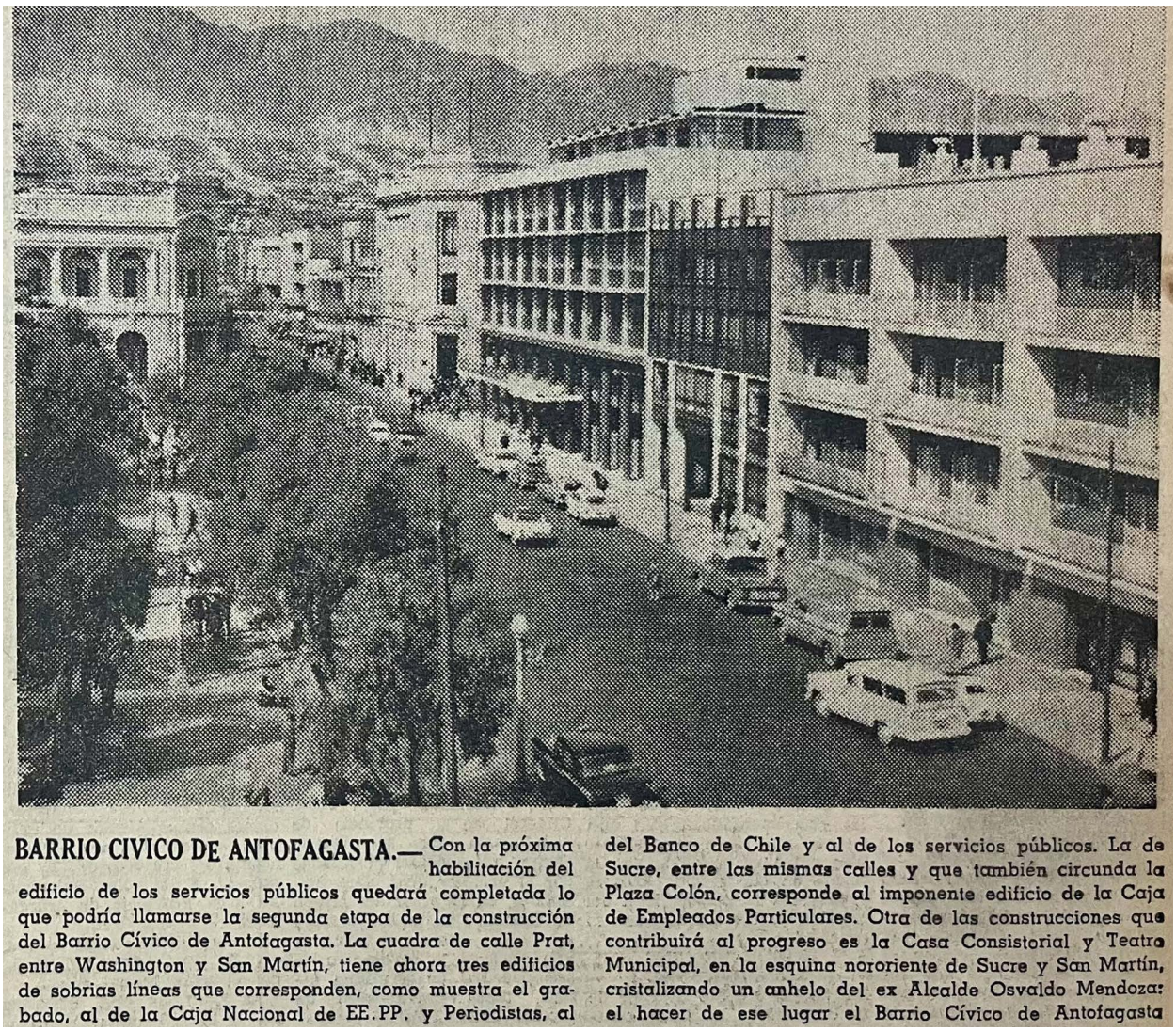

BARRIO CIVICO DE ANTOFAGASTA.— Con la próxima habilitación del edificio de los servicios públicos quedará completada lo que podría llamarse la segunda etapa de la construcción del Barrio Cívico de Antofagasta. La cuadra de calle Prat, entre Washington y San Martín, tiene ahora tres edificios de sobrias líneas que corresponden, como muestra el grabado, al de la Caja Nacional de EE.PP. y Periodistas, al del Banco de Chile y al de los servicios públicos. La de Sucre, entre las mismas calles y que también circunda la Plaza Colón, corresponde al imponente edificio de la Caja de Empleados Particulares. Otra de las construcciones que contribuirá al progreso es la Casa Consistorial y Teatro Municipal, en la esquina nororiente de Sucre y San Martín, cristalizando un anhelo del ex Alcalde Osvaldo Mendoza: el hacer de ese lugar el Barrio Cívico de Antofagasta

Figure 12. News story published in El Mercurio de Antofagasta, August 13th, 1963. Source: Author's files.

Figure 13. News story published in El Mercurio de Antofagasta, November 3rd, 1963. Source: Author's files.

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Figure 14. Public Services and Regional Government Building. Source: Photographic archive of the Directorate of Architecture (1975).

modern architectural criteria that responded both to functional needs, expressed through the agglutination of public services, and to a discourse of modernity and progress, a process inscribed in the search for greater social legitimacy "as an insurer of the principles of the welfare State for the population" (Torrent, 2013, p.15), in the most populous town of the Atacama Desert, with 87,860 inhabitants in 1960 (Statistics and Census Directorate, 1964), (Figure 12, Figure 13, and Figure 14).

THE VALUE OF MODERN ATTRIBUTES IN THE INSTITUTIONAL BUILDING

Undoubtedly, the Regional Government building can be defined as a clear exponent of the architecture of the Modern Movement. That attribute provides an important patrimonial consideration in the history of the architecture developed on the coast of the Atacama Desert during the 20th century. The key principles and characteristics are applied in the building such as functionality, simplicity and minimalism, innovative materials at the time, geometric abstraction, horizontality, openness and connection with the environment, fluid spaces and no ornamentation, in a building that opted for a Cubist appearance, with a pure and horizontal volumetry of the design with straight lines. These symmetrical and straightforward geometric volumes reinforce its sober character.

As for the facade, we can indicate that an orderly and functional grid is appreciated through a repetitive design of windows and structures. It has 10 large side windows facing San Martín Street. Of the 50 windows

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on its facade, 40 project uniformly from the third floor. The frame structure separates the windows and generates a geometric pattern. Large windows reduce the need for artificial lighting, in addition to framing the landscape with width, which facilitates the projection of the interior space. Thus, the window in modern architecture no longer only justifies a type of light, "but it shows that light and landscape simultaneously respond to each other" (Araya De Pablo, 2023, p.104).

Pilotis support the projection of the building. Thus, the ground floor is open and supported by columns, which gives the impression of a floating structure. The purpose of the pilotis is to separate the structure from the natural arrangement of geography. The land was respected in its originality, the building being the materiality that adapts. That section of the building was left free, allowing access and reinforcing the route through the building by maintaining a rational and functional relationship with the environment.

The design of the first open floor not only allows releasing the land and guaranteeing accessibility, but also configures a spatial transition between the urban and the institutional sphere, which operates as an articulating space of the building with its immediate surroundings — the city and Colón Square — through a covered gallery of continuous pedestrian circulation. This layout, in addition to responding to a logic of constructive efficiency, integrates bioclimatic criteria that favor cross-ventilation, passive thermal control and natural lighting, characteristics typical of an architecture that begins to consider the environmental conditions of the coastal desert as part of its design (Olgyay et al., 2015; Araya De Pablo, 2023). In this sense, the building not only symbolizes a modern administrative apparatus, but also an architectural response conscious of its climatic and cultural location.

In the context of the Atacama Desert, incorporating bioclimatic principles into modern architecture not only responded to a logic of thermal efficiency but also meant an intelligent adaptation to the extreme environment and an appreciation of local conditions as design inputs. Although rationalist architecture promoted a universalist formal language, in northern Chile, a situated and contextualized reinterpretation was articulated that integrated passive air conditioning strategies—such as solar orientation, cross ventilation, or the use of pilotis to avoid direct thermal contact with the ground —as constituent elements of modern design (Aravena & Lacobelli, 2016).

In this sense, the case studied is inserted into a narrative of state modernization. It represents an early trial of bioclimatic architecture in the institutional field, where it was sought to reconcile functional rationality with the use of the desert climate to reduce dependence on artificial air conditioning systems. As stated by Olgyay et al. (2015), bioclimatic architecture should not be understood as a marginal

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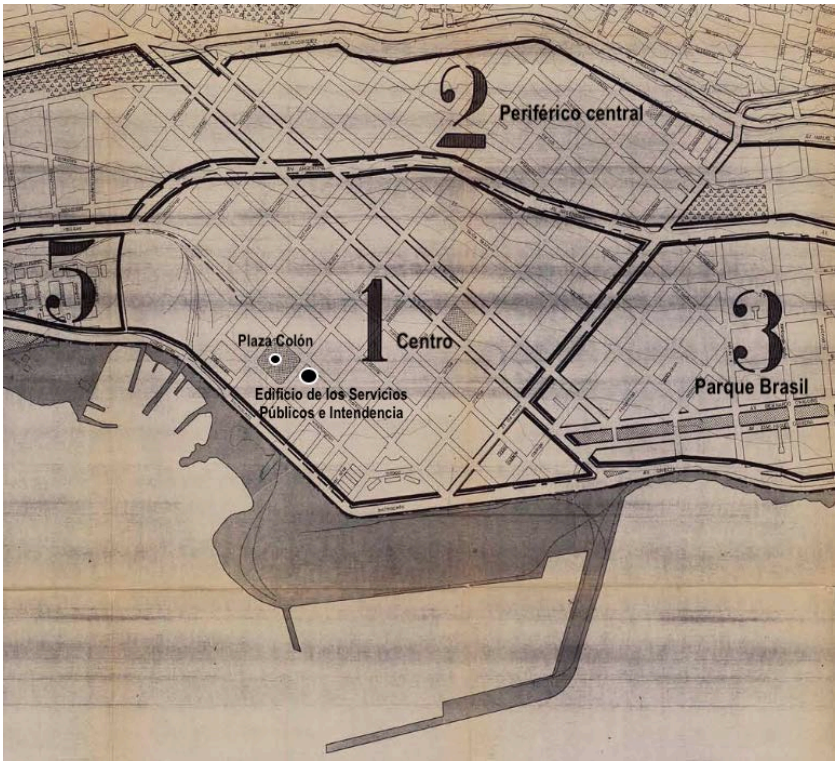

Figure 15. Fragment of the Regulatory Plan of Antofagasta of 1980, prepared by I. González, J. Matas & H. Molina. The hierarchy of the main sectors of the city is appreciated. Zone 1 - Downtown: This is the foundational and administrative heart of the city, where urban landmarks of high symbolic and institutional significance are located, such as Colón Square and the Public Services and Regional Government Building, which articulate the regional civic center. This area concentrates roles in religious buildings and commerce, government, services, and urban sociability, operating as a space representing state power and sociological centrality. Source: Author's modification based on the file of the Ministry of Housing and Urbanism, Urban Development Division, Regional Ministerial Secretariat of Antofagasta, 1980.

technique, but as an essential way of reconciling modern design with the ecological conditions of the place.

In summary, it can be indicated that superfluous elements are not appreciated. Using industrial materials, such as steel, concrete, and glass, created a resistant, efficient, and avant-garde structure. However, it also granted an aesthetic of transparency as a metaphor for clarity in State management.

Finally, its aesthetics respond to the premise that beauty lies in the structure and function itself. This rejects traditional ornamentation and consolidates the building as an example of architectural rationalism in the region. Namely, it implied a rejection of historicism by constructing a spatial organizational device for administrative efficiency and institutional control (Frampton, 2020).

Based on this, the third hypothesis is proven, in terms of the fact that the location and the modern design, which include a bioclimatic commitment, have played a key role in the consolidation of the civic center of Antofagasta, by configuring a space of representation of the political and administrative power in the region focused on rationality and functionalism (Figure 15). As Torrent (2013) states, modernity brought with it the conditions of a new state of the social situation, "they promote new ways of life made possible by technical, economic and material development" (p.10).

CONCLUSIONS

The Regional Government Building of Antofagasta represents an architectural and urban landmark reflecting the evolution of Chile's state and urban policies during the 20th century. Throughout its history, from its first buildings to the definitive construction of the current building in 1963, the building has witnessed changes in architectural and administrative paradigms, from the eclectic Gallic architecture to adopting the rationalist principles of the Modern Movement.

After the 1955 fire, the reconstruction of the Regional Government building was part of a government modernization strategy that sought to improve the state infrastructure and consolidate the institutional presence in the north of the country. Thanks to the resources from the New Deal Law to the large-scale copper mining promoted during the second administration of Carlos Ibáñez del Campo, the materialization of a functional, efficient, and representative building of progress was guaranteed.

The design projected by Edwin Weil Wohlke and the implementation of modernist criteria allowed the creation of a building that integrates multiple public services in a single space, optimizing administration and facilitating citizen access. Its structure, based on functionality, transparency, and connection with the environment, reinforced its identity as a regional key administrative node.

In short, Antofagasta's Regional Government building is a clear example of how architecture and urbanism can act as material expressions of the state's modernization. Its design and construction not only responded to functional and operational needs, but also configured a symbol of development and modernity.

Thus, the building is a tangible testimony of the impact of state policies on the transformation of urban space and the consolidation of the regional architectural heritage.

BIBLIOGRAPHIC REFERENCES

Aravena, A., y Lacobelli, A. (2016). Elemental: Incremental housing and participatory design manual. Hatje Cantz Verlag.

Araya De Pablo, R. D. (2023). La experiencia de la luz natural en la arquitectura moderna en Chile: El caso del edificio de la Estación de Biología Marina en Montemar, Viña del Mar, Quinta Región. Márgenes. Espacio Arte y Sociedad, 15(23), 102–110. https://doi.org/10.22370/margenes.2022.15.23.3610

Ardiles Vega, H. J. (2005). Historia del poder local: La comuna autónoma de Antofagasta (1891-1924). Imprenta Ercilla.

Colegio de Arquitectos de Chile. (2020). *Arquitectura Chile Premio Nacional*. Ediciones Babieca.

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ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Dirección de Estadística y Censos. (1964). *XIII Censo Nacional de Población y II de Vivienda 29 de noviembre de 1960.* https://www.ine.gob.cl/docs/default-source/censo-de-poblacion-y-vivienda/publicaciones-y-anuarios/anteriores/censo-de-poblaci%C3%B3n-y-vivienda-1960.pdf?sfvrsn=38205f0d_2

El Mercurio de Antofagasta. (16 de julio de 1955a). Debemos obtener del gobierno la construcción de un nuevo edificio, *El Mercurio de Antofagasta.*

El Mercurio de Antofagasta. (16 de julio de 1955b). El Edificio de la Intendencia quedó prácticamente destruido; en cien millones de pesos fueron avaluadas las pérdidas causadas por incendio, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (17 de julio de 1955). Estudios para construir un nuevo edificio para la Intendencia serán hechos por arquitecto proyectista, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (19 de julio de 1955). Edificio de la Intendencia será demolido una vez que sean retirados los escombros, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (3 de agosto de 1955). Jefe de Estado desea que nuevo edificio de la Intendencia concentre oficinas públicas, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (5 de febrero de 1958). Contraste, *El Mercurio de Antofagasta.*

El Mercurio de Antofagasta. (6 de febrero de 1958). 18 reparticiones funcionarán en el edificio de servicios públicos, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (12 de marzo de 1958). Con 200 millones de pesos empezarán a construir en abril nueva intendencia, *El Mercurio de Antofagasta.*

El Mercurio de Antofagasta. (20 de abril de 1958). Se aprobó el Plano Regulador, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (24 de mayo de 1958). Se inició la construcción del Edificio de Servicios Públicos e Intendencia, *El Mercurio de Antofagasta.*

El Mercurio de Antofagasta. (11 de diciembre de 1958). 100 millones de pesos se destinan anualmente para construcción de Edificio de Servicios Públicos, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (17 de septiembre de 1959). Construcción del edificio para las oficinas públicas puede quedar paralizada, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (23 de abril de 1960). Edificio para los Servicios Públicos, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (7 de agosto de 1963). Le retiraron el cierro, *El Mercurio de Antofagast*a.

El Mercurio de Antofagasta. (3 de noviembre de 1963). Obras realizadas por la Dirección de Arquitectura, *El Mercurio de Antofagasta*.

El Mercurio de Antofagasta. (16 de noviembre de 1963). Tres Subsecretarios inauguran el edificio que el gobierno construyó para los Servicios Públicos, *El Mercurio de Antofagasta.*

El Mercurio de Valparaíso (31 de agosto de 1909). Del interior, Antofagasta, obras públicas, *El Mercurio de Valparaíso.*

Frampton, K. (2020). *Historia crítica de la arquitectura moderna*. Editorial Gustavo Gili.

Galaz-Mandakovic, D. (2018). La deschilenización en el desierto de Atacama durante la postguerra. *Fuentes, Revista de la Biblioteca y Archivo Histórico de la Asamblea Legislativa Plurinacional, 12*(57), 7-17. http://www.revistasbolivianas.ciencia.bo/scielo.php?pid=S1997-44852018000400003&script=sci_arttext

Galaz-Mandakovic, D. (2019). Edificios máquinas: Arquitectura Moderna y disciplinaria del Frente Popular en Tocopilla. *AUS - Arquitectura / Urbanismo / Sustentabilidad*, (26), 29–34. https://doi.org/10.4206/aus.2019.n26-06

Galaz-Mandakovic, D. (2020). Una transformación urbana en la costa del Desierto de Atacama desde 1929: derivaciones de las visitas del presidente Carlos Ibáñez y los urbanistas Karl Brunner y Luis Muñoz Maluschka a Tocopilla, Chile. *Revista de Urbanismo*, *(43)*, 168–186. https://doi.org/10.5354/0717-5051.2020.57001

Galeno, C. (2008). Laboratorio confinado: arquitectura moderna en el norte de Chile. *Revista de Arquitectura, 14*(17), 18-29. https://doi.org/10.5354/0719-5427.2008.28175

Galeno, C. (2014). Leonello Bottacci Borgheresi en J. Floreal Recabarren, H. Ardiles (Eds.) *Forjadores de Antofagasta, 148 años de historia* (pp. 63-64). Corporación PROA.

Garzón, B. (Comp.). (2021). *Arquitectura bioclimática*. Nobuko.

Gehl, J. (2013). *Cities for people*. Island Press.

La Nación. (19 de julio de 1955). Incendio en la Intendencia de Antofagasta, *La Nación*.

Corbusier, L. (2007). *Hacia una arquitectura*. Editorial Apóstrofe.

Ley N.° 11.828. (1955, 5 de mayo). *Fija disposiciones relacionadas con las empresas productoras de cobre de la gran minería y crea el Departamento del Cobre*. Diario Oficial de la República de Chile. https://www.bcn.cl/leychile/Navegar?idNorma=26834

AS / Vol 43 / N° 67 / 2025
ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Liernur, J. F. (2001). *Arquitectura en la Argentina del siglo XX: La construcción de la modernidad*. Fondo Nacional de las Artes.

López-Durán, F. (2018). *Eugenics in the garden: Transatlantic architecture and the crafting of modernity*. University of Texas Press.

Ministerio de Vivienda y Urbanismo, División de Desarrollo Urbano, Secretaría Regional Ministerial de Antofagasta. (1980). *Plano regulador de Antofagasta* [Material cartográfico]. II Región de Antofagasta, Chile. https://www.bibliotecanacionaldigital.gob.cl/bnd/631/w3-article-350522.html

Norberg-Schulz, C. (2009). *Los principios de la arquitectura moderna*. Reverté.

Oficina Técnica Regional del Consejo de Monumentos Nacionales de Antofagasta. (Recop.). (2020). Antofagasta y su identidad moderna: *Fachadas, plantas y corte transversal del edificio, extraídos de su expediente municipal,* 1957. https://antofagastamoderna.wordpress.com/2020/05/29/nuevo-edificio-intendencia-de-antofagasta/

Olgyay, V., Olgyay, A., Lyndon, D., Olgyay, V. W., Reynolds, J., y Yeang, K. (2015). *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded.* Edition (REV-Revised). Princeton University Press. https://doi.org/10.2307/j.ctvc77kqb

Recabarren Rojas, J. F. (2003). *Episodios de la vida regional*. Ediciones Universitarias, Universidad Católica del Norte.

Senado (1956). Sesión 9ª Ordinaria, en martes 17 de abril de 1956. Archivo del Congreso Nacional de Chile [ABCN]. 415-438. https://www.bcn.cl/obtienearchivo?id=recursoslegales/10221.3/63231/1/S19560417_09.pdf

Torrent, H. E. (2013). La arquitectura moderna en la producción de la gran ciudad: Chile 1930-1970. *Anales de Investigación en Arquitectura*, 3, 7-25. https://revistas.ort.edu.uy/anales-de-investigacion-en-arquitectura/article/view/2658

Valenzuela, V. (2024). Laboratorio habitacional en ciudades-puerto del Norte Grande de Chile: Arquitectura moderna en un paisaje extremo. *Arquitek*, (25), 56-78. https://doi.org/10.47796/ra.2024i25.921

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ASSESSMENT OF SUSTAINABILITY IN EARTH-BASED CONSTRUCTION AND ARCHITECTURE

AVALIAÇÃO DA SUSTENTABILIDADE EM ARQUITETURA E CONSTRUÇÃO COM TERRA

EVALUACIÓN DE LA SOSTENIBILIDAD EN ARQUITECTURA Y CONSTRUCCIÓN CON TIERRA

Figura 0. Residence built with bagged earth and wattle and daub walls. Source: Architect - César Costa. Photo by Cecilia Prompt.

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RESUMO

A Arquitetura e Construção com Terra (ACT) é aquela que usa o solo como principal material de construção. A ACT tem relação com a arquitetura vernácula por ser contextualizada e usar majoritariamente materiais locais e naturais. O presente trabalho tem como objetivo principal avaliar a sustentabilidade em ACT. Para o estudo de caso foram escolhidas seis edificações em propriedades agrícolas familiares em Santa Catarina, Região Sul do Brasil. O método aplicado foi desenvolvido com base no Projeto VerSus, adaptado à realidade local e às normativas brasileiras. Para tanto, desenvolveu-se um sistema de indicadores para atribuição de pontuação, aplicados a princípios de sustentabilidade. Os resultados são apresentados com ênfase no âmbito socioeconômico. Neste, quatro edificações atenderam aos indicadores adotados e duas atenderam parcialmente. A análise dos resultados permitiu a compreensão da influência de fatores intrínsecos à ACT e daqueles vinculados à realidade local.

Palavras-chave: projeto VerSus, habitação rural, meio ambiente, autoconstrução, mão de obra

ABSTRACT

Earth-Based Construction (EBC) and Architecture use soil as the primary construction material. EBC is related to vernacular architecture, as it is contextualized and uses mostly local and natural materials. The main objective of this work is to evaluate EBC's sustainability. Six buildings on family agricultural properties in Santa Catarina, the southern region of Brazil, were chosen for the case study. The method was developed based on the VerSus Project and adapted to the local reality and Brazilian regulations. To this end, a system of indicators, applied to sustainability principles, was developed to assign points. The results are presented with an emphasis on the socioeconomic sphere. Four buildings complied with the adopted indicators in this assessment, and two partially did so. The analysis of the results allowed an understanding of the influence of factors intrinsic to EBC and the local reality.

Keywords: VerSus project, rural housing, environment, self-construction, labor

RESUMEN

Arquitectura y Construcción con Tierra (ACT) es aquella que utiliza el suelo como principal material de construcción. ACT está relacionado con la arquitectura vernácula, ya que está contextualizada y utiliza mayoritariamente materiales locales y naturales. El principal objetivo de este trabajo es evaluar la sostenibilidad en ACT. Para el estudio de caso, se eligieron seis edificios en propiedades agrícolas familiares, en Santa Catarina, Región Sur de Brasil. El método aplicado fue desarrollado con base en el Proyecto VerSus, adaptado a la realidad local y a la normativa brasileña. Para ello se desarrolló un sistema de indicadores para asignar puntos, aplicados a principios de sostenibilidad. Los resultados se presentan con énfasis en el ámbito socioeconómico. En este, cuatro edificios cumplieron con los indicadores adoptados y dos edificios los cumplieron parcialmente. El análisis de los resultados permitió comprender la influencia de factores intrínsecos a ACT e intrínsecos a la realidad local.

Palabras clave: proyecto VerSus, vivienda rural, ambiente, autoconstrucción, mano de obra

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INTRODUCTION

Earth-based Construction (EBC) and Architecture encompass everything that uses soil as the primary building material (Neves & Faria, 2011; Neves, 2023). Given its context and use of mainly local and natural materials, EBC has characteristics attributed to vernacular architecture (Prompt, 2021).

However, the millennial techniques of EBC have been neglected since the advent of the construction industry, which brought new technologies to the market that have become responsible for part of the planet's environmental degradation. Consequently, in the search for sustainable architecture, the use of non-industrialized materials in project design is growing, and the modern interpretation of ancient techniques provides them with credibility. Earth, therefore, becomes a possibility for constructing buildings with low environmental impact due to its reduced embodied energy (Niroumand et al., 2017).

Some characteristics of EBC are related to concepts attributed to vernacular architecture, such as: (1) prioritizing the use of local materials (Niroumand et.al., 2017); (2) occupation of an area by a group with similar sociocultural conditions, long-term permanence in the place, and the evolution of construction systems (Ferreira, 2014); (3) transmission of techniques between community members (Okretic et al, 2024); and (4) simplicity, adaptability, creative nature and plastic intention as a result of the techniques and materials used (Weimer, 2005)

EBC production in Brazil has been the subject of research, projects, works, and the development of technical standards (Prompt & Lisboa, 2022). However, its production is artisanal and experimental, often used without technical support from a qualified professional, from the project to the work itself. Thus, problems arise that can compromise the building's quality (Prompt, 2012).

In Brazil, contemporary earth-based architecture has been strongly influenced by the spread of permaculture (Neves et al., 2022). In the country's southern region, where the state of Santa Catarina is located, small family farms dominate, and rural social movements are strong. In this context, several EBC projects (Prompt & Librelotto, 2018) have been implemented with objectives such as technological autonomy and sustainable development (Neves et al., 2022).

Prompt (2012) evaluated nine buildings built using earth in family farms in western Santa Catarina. The buildings were appropriate to the sociocultural context in which they were inserted, but some situations could compromise their sustainability. To understand these aspects, the main objective of this study was to evaluate sustainability in earth-construction buildings through a post-occupation evaluation after ten years of use.

This analysis selected a sample of six buildings (Table 1) in the municipalities of Seara, Paial, and Arabutã (Figure 1, Figure 2, Figure 3, and Figure 4), all on family farms (Figure 5, Figure 6, Figure 7, and Figure 8). This article intends to report the study conducted, emphasizing the socioeconomic aspect of sustainability (Figure 9, Figure 10, and Figure 11).

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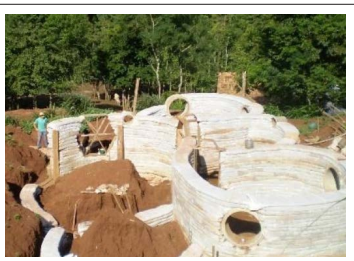
	Year	Use	Built Area	Techniques Used	Labor System	Photo
Building 01	2002	Seed storage	30 m²	Hand-rammed bagged Earth	Self-build	
Building 02	2008	Residential	112 m²	Bagged earth, CEB	Self-build	
Building 03	2009	201 m²	Residencial	Hand-rammed bagged earth, cordwood	Self-build	
Building 04	2011	Residential	222 m²	Hand-rammed bagged earth, vegetable cover	Self-build/contractor in specific stages	
Building 05	2010	Residential	139 m²	Bagged earth, vegetable cover	Self-build	
Building 06	2019	Residential	292 m²	Hand-rammed	Contractor/Self-Build	

Table 1: Presentation of Case Studies Source: Prepared by the authors.

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Figure 1. Building for seed storage comprising bagged earth and mortar ramming. Source: Photo by Cecilia Prompt.

Figure 2. Residence built with bagged earth and compressed earth blocks. Source: Architect - Iuri Moraes. Photo by Cecilia Prompt.

Figure 3. Residence built with bagged earth and a green roof. Source: Architecture - Silvio Santi. Photo by Cecilia Prompt.

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Figure 4. Residence built with bagged earth and a green roof. Source: Architect - Silvio Santi. Photo: Cecilia Prompt.

Figure 5. Residence built with wooden structure, wattle and daub walls, and a green roof. Source: Architect - Silvio Santi. Photo: Cecilia Prompt.

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Figure 6. Residence built with wooden structure, wattle and daub walls, and a green roof. Source: Architect - Silvio Santi. Photo by Cecilia Prompt.

Figure 7. Shed with joinery and storage, made from bagged earth. Source: Photo: Cecilia Prompt.

Figure 8. Residence built with wooden structure, wattle and daub and bagged earth walls, and a green roof. Source: Architect - Cecilia Prompt. Photo by Cecilia Prompt.

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Figure 9. Residence built with wooden structure, wattle and daub and bagged earth walls, and a green roof. Source: Architect - Cecilia Prompt. Photo by Cecilia Prompt.

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Figure 10. Residence built with bagged earth and wattle and daub walls. Source: Architect - César Costa. Photo by Cecilia Prompt.

Figure 11. Residence built with bagged earth and wattle and daub walls. Source: Architect - César Costa. Photo by Cecilia Prompt.

THEORETICAL FRAMEWORK

Sustainable architecture

Architecture production has always been related to the environment, since its primary role is shelter and protection from the weather. The concept of sustainability in architecture has grown alongside the environmental movement. Zambrano (2008) shows the evolution of the concept from solar architecture (1970). From the late 1990s, the concept evolved into sustainable architecture, which views sustainability more broadly, reaching the environmental, social, and economic spheres. Hence, it is understood that a balance between these three areas is necessary to achieve sustainability in a building (Silva, 2003).

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Because the buildings analyzed in this research are examples of EBC, they are related to the concept of bioconstruction, which treats the building as a biological unit that interacts with the natural environment and its social, cultural, and economic environment. The house should be designed to take advantage of the climate, prioritizing using natural materials (such as Earth) that are local, recycled, or have little processing. This architecture is closely tied to permaculture, which treats the building as the center of the project and states that the built space must be in harmony with the environment (Borges & Prompt, 2024; Vegas et al., 2014; Mars, 2008; Morrow, 2010).

To seek a method for assessing sustainability in rural buildings that dialogues with the particular aspects of EBC and considers the relationships between it and vernacular architecture, sustainability in architecture must be contextualized and adapted to specific situations (Prompt, 2012). Housing in rural settings allows families to stay in the countryside, not only for social reproduction, but also for work-related activities. That is, buildings in a family farming context are sustainable as long as they contribute to human development, reduce social inequality, and eradicate poverty. Factors regarding the environmental sphere must be observed: a well-ventilated and lit environment, which does not use toxic materials, generates health and well-being, and contributes to the quality of life and ability to work.

In a context where self-construction is common, social interaction between family farmers is possible thanks to exchanging experiences and hours of work on the construction site and professional training for farmers who begin to work in earth-based constructions as an economic activity (Prompt, 2012). Socioeconomic distribution, in turn, impacts the environment and the activity itself (Borges, 2023). Therefore, architecture is understood not as a final, static product but as a transformative process (from conception to use and demolition) for the user (Guizzo, 2018). Different exchanges emerge from the interconnection within the rural space in the production, which are also established between the building and the people. (Glaeser, 2024).

From the perspective of architecture as a process, the educational potential of construction is emphasized, either through teaching activities and labor training or by the didactic demonstration of the technologies used. This dynamic, already widespread in academic contexts (Bessa & Librelotto, 2021), can be extended to community experiences.

Socio-economic aspects and their associations with architecture and earth-based construction

The economy and society are subsets integrated into nature, manifesting themselves in the biosphere's spatial organization. As one of these subsets, society involves a wide range of local, regional, and global exchanges. In the social sphere, the economy is dedicated explicitly to symbolic relationships

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and/or monetary exchanges that are socially accepted in a given local or regional context (Cavalcante, 2022).

Inhabiting the Earth, the manifesto for the right to build with earth, released by the journal, ***EcologiK E Architectures à Vivre*** in partnership with CRAterre, the National Higher School of architecture of Grenoble and UNESCO Chair (AEDO, 2014), highlights that earth-based construction promotes the use of a local resource that is especially accessible to those with fewer resources, since they can build directly with the earth available beneath their feet.

Neves and Faria (2011) state that earth is widely used to build shelters in low-income communities, especially in developing countries, where the survival of primitive building systems is associated with the need for housing. In turn, Weimer (2005), when specifically analyzing EBC in a context of popular production, points out that earth-based construction is "very cheap", which possibly contributes to the perception of this technique as being of "low quality". However, it is important to highlight that low cost is directly linked to local soil availability and community collaboration in construction, a common situation in populations that traditionally build with earth.

The demand for housing requires a socioeconomic analysis that prioritizes community self-sufficiency. Fathy (2009) demonstrated that traditional timber was replaced with vaulted structures made with adobe to make housing construction for low-income peasants economically viable.

Activities aimed at disseminating earth construction techniques are recurrent in environmental education centers that become business models. Well-established examples of these sites are Tibá – Intuitive Technology and Bio-architecture, and IPEC – Institute of Permaculture and Ecovillages of Cerrado. In the state of Santa Catarina, Nova Oikos stands out. It disseminates EBC, among other techniques for construction and food production (Prompt & Librelotto, 2019).

The Versus Project and its socio-economic focus

The Versus - Vernacular Knowledge for Sustainable Architecture - Project was developed under the leadership of the Escola Superior de Gallaecia (Portugal), in partnership with the École Nationale Supérieure ***d'architecture*** of Grenoble (France), the ***Universitat Politècnica de Valencia*** (Spain), and ***Università degli Studi di Firenze*** and ***Università degli Studi di Cagliari*** (Italy). The project is based on principles of vernacular architecture to develop building sustainability strategies (Correia, Dipasquale & Mecca, 2015).

Its two main objectives are: (1) to recognize vernacular heritage in its historical qualities and values, highlighting its potential contribution to

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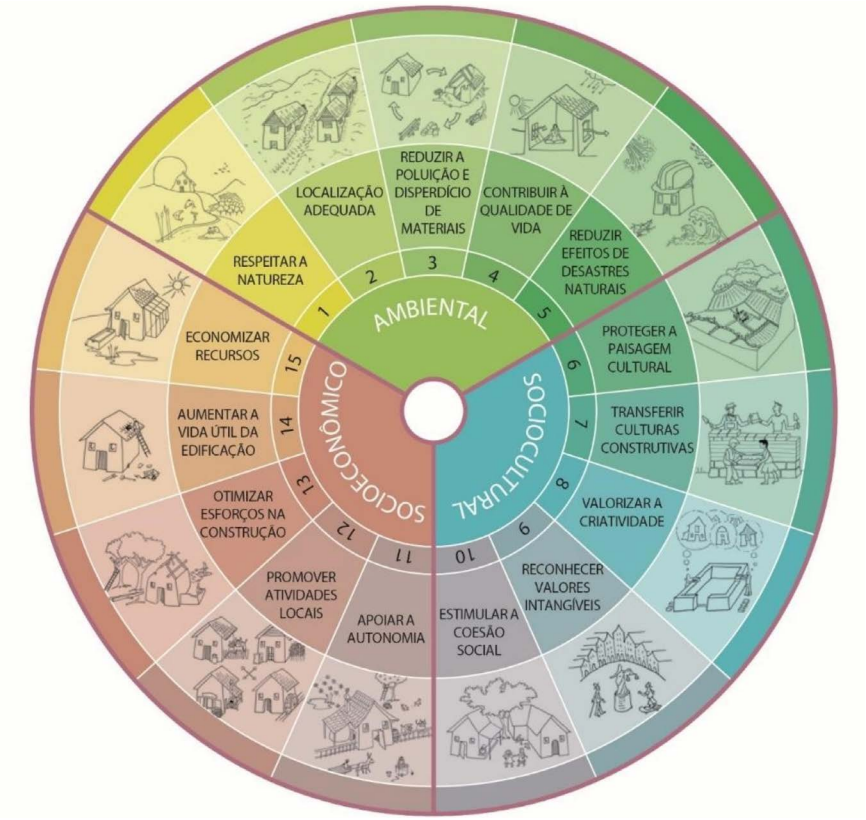

Figure 12. Principles and strategies for sustainability in architecture according to the VerSus Project. Source: Adapted from Guillard et al. (2014). Translation by the authors.

the sustainability of contemporary architecture, and (2) to disseminate and adapt these principles, strategies and techniques to current needs in terms of culture, identity, constructive quality and environment. Figure 12 presents the illustrative outline of the VerSus Project's assessment principles.

The socioeconomic dimension encompasses principles 11 to 15 (Figure 12). Traditionally analyzed based on financial aspects and monetary values, this dimension acquires another perspective when observed from vernacular architecture, where the concept of cost is associated with the notion of human effort and the investment of non-necessarily financial resources.

The eleventh principle seeks to promote autonomy. The proposed strategies are (11.1) resource sharing, (11.2) use of local and accessible materials and resources, (11.3) promotion of local crafts, (11.4) encouragement of local production, and (11.5) promotion of community empowerment. This principle is associated with concepts such as self-sufficiency, integration between housing and productive activities, access to water, and food safety.

The twelfth principle seeks to promote local activities. The proposed strategies are (12.1) strengthening urban agriculture and local food production systems; (12.2) reducing displacement; (12.3) promoting the collective use of spaces; (12.4) including areas destined to productive

activities on urban and architectural scales, and (12.5) developing handmade products based on local resources.

The thirteenth principle deals with optimizing construction processes. The associated strategies are (13.1) optimizing the use of materials; (13.2) adapting the scale of buildings; (13.3) technical simplification of construction systems; (13.4) reducing material transport distances; and (13.5) using materials with a low level of processing. This principle is associated with concepts such as multiple-use spaces and planning the work in stages.

The fourteenth principle refers to extending the useful life of buildings. The strategies are (14.1) provision for periodic replacement of building elements; (14.2) consideration of the effects of erosion on materials; (14.3) planning maintenance over time; (14.4) design of spaces flexible to changes and extensions; and (14.5) construction of sturdy and durable structures. This principle is associated with concepts of resistance of materials and adaptability of environments.

The fifteenth principle deals with the economy of resources. The strategies are (15.1) the use of recyclable materials; (15.2) the promotion of urban densification; (15.3) guaranteed supply from renewable energy sources; (15.4) the development of building systems appropriate to local conditions; and (15.5) the implementation of natural ventilation, heating, and lighting solutions. This principle is associated with energy efficiency, using renewable energies, reducing embodied energy, and adopting passive systems for heating and cooling buildings.

Post-Occupation Assessment

According to Li, Froese, and Brager (2018), post-occupation assessment (POA) is a process for assessing a building's performance after a specific period of use. The authors emphasize that POA is restricted to the building's use phase. Galvão, Ornstein, and Ono (2013) define POA as "a set of methods and techniques with potential application in the environments in use," highlighting its character as aimed at analyzing buildings in operation.

METHODOLOGY

A method based on the principles and strategies of the Versus Project was developed to perform a post-occupation analysis from the perspective of sustainability in earth-based constructions.

The approach adopted, denominated in this study as the Versus method, was chosen because it integrates, in its conception, guidelines focused on sustainability in buildings that present characteristics of vernacular architecture.

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Based on this reference, a scoring system was developed to evaluate each item (Table 2). The proposal involves assigning a score to the 75 VerSus strategies and classifying each one into three levels: "complies," "partially complies," and "does not comply." The assessment of each strategy was based on developing a set of indicators (Prompt, 2021, pp. 105-112) that guided the assignment of scores according to the degree of compliance observed.

Table 2. Symbology and scoring to evaluate each of the 75 strategies. Source: Prepared by the authors.

Assessment	Symbol	Scoring
Complies		1
Partially Complies		0,5
Does not comply		0

Initially, each of the 75 strategies was evaluated individually. Then, the arithmetic mean of the assigned scores was calculated to obtain the score for each principle. Subsequently, the reverse process was applied: through a scoring system defined for each principle (Table 3), it was possible to evaluate each aspect by consolidating the results of the principles it comprises.

Table 3. Scale for assigning symbology to each principle and each aspect. Source: Prepared by the authors.

Scoring	Assessment	Symbol
0 – 1,6	Complies	
1,7 – 3,4	Partially Complies	
3,5 – 5	Does not comply	

The methodological procedures adopted included a bibliographic review, documentary analysis, architectural survey, photographic record, visual inspection, in situ observation, questionnaire application, and semi-structured interviews.

Specific indicators were defined for evaluating each strategy (Prompt, 2021, pp. 105 to 112), as shown in Table 4, which presents the indicators used in evaluating Principle 11.

Table 5 presents the results of the analysis of the six buildings in the scope of the socioeconomic sphere:

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Principle 11 - Promoting autonomy		
Item	Strategy	Indicator
11.1	Resource sharing	• Foresee sharing systems, services, and energy sources • Promote fair compensation for the worksite team • Share knowledge about technologies • Share resources produced around the building
11.2	Use of locally accessible materials and resources	• Incorporate, into the process, qualified resident professionals from the region • Use materials extracted from the site itself • Use locally produced materials • Use recycled or repurposed materials
11.3	Promotion of local crafts	• Choose artisanal construction techniques • Provide or use indoor architectural elements of local artisans • Allow artistic expressions during the work
11.4	Stimulating local production	• Add food production systems around the building • Add places for processing and storing food
11.5	Promotion of community empowerment	• Promote teaching and training activities related to construction • Stimulate self-construction

Table 4. Indicators to assess Principle 11. Source: Prepared by the authors

Table 5. Result of the analysis of the six buildings for the socio-economic sphere. Source: Prepared by the authors

	Building					
	01	02	03	04	05	06
Principle 11	✓	✓	✓	✓	✓	✓
Principle 12	✓	✓	✗	○	○	✓
Principle 13	✗	✗	✗	✗	✗	✗
Principle 14	✓	○	○	✓	✓	✓
Principle 15	○	✗	✗	✓	✗	○

RESULTS

From this point, the evaluation of principles 11 to 15 is discussed to approach the analysis in the socioeconomic sphere effectively. This seeks to reflect on the strategies adopted in the case study, place them in an expanded perspective, and consider the possibility of applying the method in other contexts.

Principle 11: Promotion of autonomy.

The general assessment of principle 11 highlights the following aspects: the sharing of knowledge and labor as a practice resulting from EBC; the use of materials from the site itself; the absence of technical support in certain situations; the possibility of artistic expression provided by the use of earth and other natural materials; know-how rooted in local culture;

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housing as a factor of permanence of families in rural areas; and food production integrated into buildings as a characteristic element of the analyzed context.

Principle 12: Promotion of local activities

The assessment of principle 12 revealed the following factors of influence: agricultural production as families' main economic activity; economic activities within the properties; the existence of private spaces with no community use; the provision, in projects, of rooms to support production activities; and the development of bamboo-manufactured products, directly related to EBC practices.

Principle 13: Optimize construction processes

The assessment of principle 13 identified the following influencing factors: reworking due to the poor application of technologies, attributed to technical ignorance; inadequate choice of construction techniques due to lack of knowledge about the type of soil; use of fragile and untreated wood, resulting in pathological manifestations; inadequacy in dimensions and functionality of the designed spaces, associated with failures in the design stage; the ECB, as it is still innovative in the region, presents additional challenges; on the other hand, the predominance of little processed materials from the site itself, contributes to the reduction of transportation-related efforts.

Principle 14: Extension of the building's useful life

The assessment of Principle 14 revealed the following influencing factors: absence of manuals for use, operation, and maintenance of buildings; degradation of construction elements due to poor application of techniques or abandonment; lack of regular maintenance practices; use of rigid construction techniques, such as bagged earth and compressed earth blocks (CEB), which hinder future extensions or modifications; presence of low quality industrialized materials; and use of fragile wood without adequate treatment.

Principle 15: Saving resources:

The assessment of principle 15 showed the following influencing factors: use of reused materials or from demolition; adoption of organic forms that, in some cases, generate residual spaces; presence of environments with excessive dimensions, which compromise comfort and functionality; absence or non-use of installation systems, reflecting the absence of complementary projects in most buildings; ignorance or inadequate choice of local soil; and inefficiency in ventilation and daylighting systems.

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CONCLUSION

This study aimed to present the results of evaluating sustainability in buildings built with earth, emphasizing the socio-economic aspect. The final considerations focus on the relationship between the data obtained, the factors intrinsic to earth-based construction (ECB) and architecture, and the local family farming culture in the studied region.

First, the factors that contributed positively to the results of the evaluations are highlighted. Among the positive aspects associated with the use of earth, it is identified that: (1) EBC, as an artisanal technology, stimulates the local production of manufactured items; (2) favors sharing knowledge, as it is a technology in constant development, dependent on local conditions; (3) encourages collaboration through sharing labor; and (4) allows extracting material directly from the ground, reducing logistical efforts with transport. On the other hand, aspects such as rework and low durability, often associated with inadequate technique application, especially in self-construction contexts, adversely impacted the building's assessment.

As for the positive factors intrinsic to the reality of family farming, the following stand out: (1) know-how, although not directly linked to civil construction, is part of the local culture and contributes to the efficient execution of the projects; (2) the existence of adequate housing is a fundamental element for families to stay in the countryside and the continuity of their economic activities; (3) the integration between food production and housing space reflects the logic of family farming and represents a favorable sustainability criterion; and (4) the fact that the main economic activity occurs on the property itself contributes to reducing transportation and travel costs.

Factors that negatively impacted the analyses were also identified, especially those related to the design stage. The following stand out: (1) the absence of detailed studies on solar incidence on buildings; (2) the absence of installation projects in most cases, in addition to treated water management as a secondary aspect; (3) the lack of passive strategies appropriate to the bioclimatic zone; (4) the failure to meet the minimum requirements for daylighting and ventilation established by NBR 15550; and (5) inadequate design decisions regarding the dimensions of spaces, resulting in excessively large rooms, with potential for thermal discomfort and increased energy consumption for heating.

Some reflections arise regarding the application of the VerSus method. Considering its particularities, to what extent would it be possible to reproduce it in different contexts? Would its principles, based on solidarity and collaborative relationships, be adaptable to conventional commercial contexts? Moreover, would the results be equivalent if the buildings in this study were evaluated by another method to measure sustainability?

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Applying the VerSus method to other types of buildings may allow comparative analyses in future studies. In addition, the project objectives recommend incorporating the VerSus principles and strategies even in the work's design and planning phase. Finally, it is suggested that didactic material that is accessible beyond the academic world be prepared. This material should support the popular production of EBC and the work of professionals in the area. It should integrate the principles of VerSus and adapt them to Brazilian reality.

CONTRIBUTIONS FROM CRediT AUTHORS

Conceptualization, C.H.P., J.L.B., and L.I.L.; Data curation, C.H.P.; Formal analysis, C.H.P.; Obtaining funding, C.H.P., and L.I.L.; Research, C.H.P.; Methodology, C.H.P., L.I.L.; Project management, C.H.P., and L.I.L.; Supervision, C.H.P., and L.I.L.; Validation, C.H.P.; Writing - original draft, C.H.P., J.L.B., and L.I.L.; Writing - revision and editing, C.H.P., and L.I.L.

BIBLIOGRAPHIC REFERENCES

Aedo, W. C. (24-28 de noviembre de 2014). ¿Por qué construir con tierra? Universalidad y sostenibilidad [Sesión de conferencia]. 14° Seminario Iberoamericano de Arquitectura y Construcción con Tierra (SIACOT), Anais, San Salvador.

Bessa, S. A. L., e Librelotto, L. I. (2021). A importância das práticas construtivas nos canteiros experimentais em cursos de arquitetura e urbanismo. PARC Pesquisa em Arquitetura e Construção, 12(00), e021028. https://doi.org/10.20396/parc.v12i00.8660850

Borges, J. (2023), Uma introdução à economia ecológica: ideias para um primeiro debate. Em H. Costa de Brito, M. M. Neto da Silva (Org.). *Meio Ambiente e Sustentabilidade: Pesquisa, reflexões e debates emergentes*. (1 ed. Vol. IV, pp. 196-206). Amplla Editora. https://doi.org/10.51859/amplla.mas3200-1

Borges, J. C. L. , e Prompt, C. H. (2024). Energetic study applied to permaculture in Barra da Lagoa in Santa Catarina. *LUMEN ET VIRTUS*, 15(39), 2942-2956. https://doi.org/10.56238/levv15n39-103

Cavalcanti, C. (2022). Economia ecológica: desafio à interdisciplinaridade: Uma possível referência para o desenho de sistemas humanos realmente sustentáveis. *Inovação & Desenvolvimento: A Revista da FACEPE*, 1(8), 17-24. https://revistainovacao.facepe.br/index.php/revistaFacepe/article/view/82/96

Correia, M., Dipasquale, L., e Mecca, S. (Eds.). (2015). *VERSUS: HERITAGE FOR TOMORROW: Vernacular Knowledge for Sustainable Architecture*. Firenze University Press. https://library.oapen.org/viewer/web/viewer.html?file=/bitstream/handle/20.500.12657/55140/9788866557425.pdf?sequence=1&isAllowed=y

Fathy, H. (2009). *Arquitetura para os pobres. Uma experiência no Egito rural.* Dinalivro.

Ferreira, T. L. (2014). *Arquiteturas vernáculas e processos contemporâneos de produção: Formação, experimentação e construção em um assentamento rural* [Tese de Doutorado em Arquitetura, École Nationale Supérieure d'Architecture de Grenoble]. Instituto de Arquitetura e Urbanismo da Universidade de São Paulo, Grenoble. http://www.teses.usp.br/teses/disponiveis/102/102131/tde-08092015-142648/

Galvão, W. J. F., Ornstein, S. W., e Ono, R. A. (2013). Avaliação pós-ocupação em empreendimentos habitacionais no Brasil: da reabilitação aos novos edifícios. Em S. Barbosa Villa, Sh. Walbe Ornstein, (Comps.), *Qualidade ambiental na habitação: avaliação pós-ocupação* (1° ed., pp. 1-400). Oficina de Textos.

Glaeser, L. M. (2024). Ruptura metabólica: a visão de Marx sobre a desconexão do ser humano com a natureza pelo capitalismo. *Alamedas, 12*(3), 256-262. https://doi.org/10.48075/ra.v12i3.33218

Guillaud, H., d'Architecture de Grenoble, É. N.S., Moriset, S., Sánchez Muñoz, N., e Sevillano Gutiérrez, E. (Eds.). (2014). *Lessons from vernacular heritage to sustainable architecture*. Versus leçons du patrimoine vernaculaire pour une architecture durable lezioni dal patrimonio vernacolare per l'architettura sostenibile contributo do património vernáculo para a arquitetura sustentável lecciones del patrimonio vernáculo para una arquitectura sostenible. CRAterre & Escola Superior Gallaecia. https://www.esg.pt/versus/pdf/versus_booklet.pdf

Guizzo, I. O. (2018). O construir como afeto: A casa como corpo e não manifesto. Arquitextos, 19(218.04). https://vitruvius.com.br/revistas/read/arquitextos/19.218/7030

Li, P., Froeser, T. M., e Brager, G. (2018). Post-occupancy evaluation: State-of-the-art analysis and state-of-the-practice review. *Building and Environment, 133*, 187-202. https://doi.org/10.1016/j.buildenv.2018.02.024

Mars, R. O. (2008). *O design Básico em Permacultura*. Via Sapiens.

Morrow, R. (2010). *Permacultura passo a passo.* Mais Calango.

Neves, C. (2023). *Materiais de construção* e sistemas construtivos com T*erra*. Ed. da Autora

Neves, C., Fernandes Maranho, M., Lelis, N., e Borges Faria, O. (Eds). (2022). *Arquitetura e construção com terra no Brasil* (1° ed., pp. 1-251). ANAP.

Neves, C., e Faria, O. B. (Org.). (2011). *Técnicas de construção com terra*. Faculdade de Engenharia de Bauru/Red Iberoamericana PROTERRA. https://redeterrabrasil.net.br/wp-content/uploads/2020/08/T%C3%A9cnicas-de-constru%C3%A7%C3%A3o-com-terra.pdf

Niroumand, H., Kiberdt, C. J., Barcelob, J. A., e Saaly, M. (2017). Contribution of national guidelines in industry growth of earth architecture and earth buildings as a vernacular architecture. *Renewable and Sustainable Energy Reviews, 74*, 1108-1118. https://doi.org/10.1016/j.rser.2017.02.074

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ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Okretic, G. A. V. W., Carlos, Y. B. A., Santana, D. R., Ximenes Santos, I. e Rodrigues Silveira, M. T. (2024). Grupo de Pesquisa Sobre Arquitetura Vernácula: técnicas utilizadas no interior do Ceará. Em O. B. Faria, S.S.B. Saraiva, e L. Maia (Eds.). *TerraBrasil 2024 - Congresso de Arquitetura e Construção com Terra no Brasil* (9º ed., pp. 439-452). TerraBrasil / UFBA. https://www.academia.edu/122158858/TerraBrasil_2024_I

Prompt, C. H. (2012). *Arquitetura de Terra em Unidades Agrícolas Familiares: Estudo de Caso no Oeste Catarinense* [Tese de Mestrado, Universidade Federal de Santa Catarina]. Repositório Institucional UFSC. http://repositorio.ufsc.br/xmlui/handle/123456789/101027

Prompt, C. H. (2021). *Avaliação da Sustentabilidade em Arquitetura e Construção com Terra. Estudo de Caso no Oeste Catarinense* [Tese de Doutorado, Universidade Federal de Santa Catarina]. Repositório Institucional UFSC. https://repositorio.ufsc.br/handle/123456789/231172

Prompt, C. H., e Librelotto, L I. (2018). Arquitetura e Construção com Terra em Santa Catarina. Em C. Neves, F. Cardoso, e L. Maia (Orgs.). *TerraBrasil 2018 - Congresso de Território e trabalho: a produção da arquitetura com terra no Brasil* (7º ed., pp. 346-355). TerraBrasil / UFBA. https://www.academia.edu/122137212/Terra_Brasil_2018

Prompt, C. H., e Librelotto, L. I. (2020). Avaliação da Sustentabilidade em Arquitetura e Construção com Terra. Adaptação do Método Versus em Santa Catarina. Em *Actas 2º Seminário Arquitetura Vernácula Patrimônio & Sustentabilidade* (2ª ed.). https://static.even3.com/anais/202463.pdf

Prompt, C. H., e Lisboa, S. (2022). Panorama dos Profissionais da Arquitetura e Construção com Terra na Região Sul do Brasil. Em C. Neves, F. Cardoso, e L. Maia (Eds.). *TerraBrasil 2022 - Congresso de Arquitetura e Construção com Terra no Brasil* (8ª ed., pp. 307-318). TerraBrasil: UFSC. https://www.fundacionantoniofontdebedoya.es/libro-terra-brasil/

Silva, V. G. (2003). *Avaliação da sustentabilidade de edifícios de escritórios brasileiros: diretrizes e base metodológica* [Tese de Doutorado, Universidade de São Paulo]. Biblioteca Digitas USP. https://doi.org/10.11606/T.3.2003.tde-10032025-143614

Vegas, F., Mileto, C., Guimaraens, G., e Navalón, V. (2014). Defining Sustainable Architecture. Em M. Correia, L. Dipasquale, S. Mecca (Eds.) *VERSUS: Heritage for Tomorrow: vernacular Knowledge for Sustainable* Architecture (pp.34-39). Firenze University Press. https://doi.org/10.36253/978-88-6655-742-5

Weimer, G. (2005). *Arquitetura Popular Brasileira*. WMF Martins Fontes

Zambrano, L. M. A. (2008). *Integração dos Princípios da Sustentabilidade ao Projeto de Arquitetura* [Tese de Doutorado, Universidade Federal do Rio de Janeiro]. PROARQ — Programa de Pós Graduação em arquitetura da UFRJ. https://proarq.fau.ufrj.br/producao/teses-e-dissertacoes/1032/integracao-dos-principios-da-sustentabilidade-ao-projeto-de-arquitetura

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INTRINSIC JUXTAPOSITIONS ON THE FAÇADE OF THE ALHAMBRA THEATER, TALTAL, CHILE

YUXTAPOSICIONES INTRINSECAS EN LA FACHADA DEL TEATRO ALHAMBRA, TALTAL, CHILE

JUSTAPOSIÇÕES INTRÍNSECAS NA FACHADA DO TEATRO ALHAMBRA, TALTAL, CHILE

Figure 0. Façade of the Alhambra Theater and its relationship with the square. Source: Preparation by the Author.

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RESUMEN

El Teatro Alhambra de Taltal constituye una significación histórica y patrimonial relevante para la ciudad, su fachada presenta un lenguaje arquitectónico heterogéneo implícito en sus proporciones, accesos y elementos ornamentales, que configuran una expresión volumétrica unitaria. Hasta el momento, se han realizado diversos estudios y publicaciones que relevan su historia, materialidad e imagen urbana, generándose informes técnicos de diagnósticos sobre su situación actual, con levantamientos críticos del inmueble y propuestas de alternativas de uso para su rehabilitación. Siendo de interés abordar mediante un análisis exploratorio las peculiaridades de su frontis. Esta investigación se centra en la develación de ordenes intrínsecos, como expresiones originadas desde su volumetría, el estudio de la distribución y dimensión de programas arquitectónicos que se yuxtaponen en el mismo plano, como la pastelería y la residencia familiar. Mediante el método de la observación, comparación y análisis de las expresiones geométricas presentes en la fachada del edificio, se abren las posibilidades de indagar en las singularidades arquitectónicas que lo relevan y unifican, lo que permite encontrar contenidos en las proporciones y disposición de los vanos como se redibujan y enuncian las geometrías estructurales de la sección transversal del edificio. Asimismo, los programas de usos integrados vienen a extender y amplificar la imagen de su fachada rectangular hacia el espacio público circundante, que complementan las actividades particulares del Teatro, que generan diversas simetrías verticales en la fachada propias de la arquitectura georgiana, estructurándose una unidad reconocible de mayor magnitud escalar, que contribuye a la puesta en valor de un Monumento Histórico.

Palabras clave: arquitectura, geometría, monumento histórico, patrimonio urbano, simetría

ABSTRACT

Taltal's Alhambra Theater has a relevant historical and patrimonial meaning for the city. Its façade has a heterogeneous architectural language implicit in its proportions, entrances, and ornamental elements, configuring a unitary volumetric expression. Several studies and publications have revealed its history, materiality, and urban image, generating technical reports about its current state, with critical surveys of the property and proposals for alternative uses with its rehabilitation. However, it is interesting to address its façade's specificities through an exploratory analysis. This research focuses on intrinsically unveiling, from its volumetry, a study of the layout and size of architectural programs juxtaposed on the same plane, such as a pastry shop and a family residence. Through observation, comparison, and analysis of the geometric expressions in the building's facade, possibilities of investigating the architectural singularities that reveal and unify it are opened, which allows finding contents in the proportions and arrangement of the openings as the structural geometries of the building's cross-section are redrawn and enunciated. Similarly, the integrated uses extend and amplify the image of its rectangular façade towards the surrounding public space, which complements the Theater's activities, generating diverse vertical symmetries on the Georgian style façade, structuring a unit recognizable by its magnitude, which contributes to its valorization as a Historical Monument.

Keywords: architecture, geometry, historical monument, urban heritage, symmetry

RESUMO

O Teatro Alhambra de Taltal possui um significado histórico e patrimonial relevante para a cidade. Sua fachada apresenta uma linguagem arquitetônica heterogênea implícita em suas proporções, acessos e elementos ornamentais, que configuram uma expressão volumétrica unitária. Até o momento, foram realizados diversos estudos e publicações que destacam sua história, materialidade e imagem urbana, gerando relatórios técnicos de diagnóstico sobre sua situação atual, com levantamentos críticos do edifício e propostas de usos alternativos para sua reabilitação. É de interesse abordar as peculiaridades de sua fachada por meio de uma análise exploratória. Esta investigação centra-se no desvelamento de ordens intrínsecas, como expressões originadas a partir de sua volumetria, no estudo da distribuição e dimensão de programas arquitetônicos que se justapõem no mesmo plano, como a confeitaria e a residência familiar. Por meio do método de observação, comparação e análise das expressões geométricas presentes na fachada do edifício, abrem-se as possibilidades de investigar as singularidades arquitetônicas que o destacam e unificam, permitindo-nos encontrar conteúdo nas proporções e na disposição das aberturas, na forma como as geometrias estruturais da seção transversal do edifício são redesenhadas e enunciadas. Da mesma forma, os programas de usos integrados expandem e ampliam a imagem de sua fachada retangular para o espaço público circundante, complementando as atividades particulares do Teatro, que geram diversas simetrias verticais na fachada típica da arquitetura georgiana, estruturando uma unidade reconhecível de maior magnitude escalar que contribui para a valorização de um Monumento Histórico.

Palabras clave: arquitetura, geometria, monumento histórico, patrimônio urbano, simetria

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INTRODUCTION

This research focuses on the compositional elements of the facade of Taltal's Alhambra Theater. Located in the Antofagasta region, Chile, this is an early 20th-century building of historical heritage and architectural relevance in northern Chile. It was built in 1921 as a response to an evident need for entertainment, fostering cultural development for the commune's inhabitants and for the large number of workers who arrived from various parts of the country due to the saltpeter boom. At the time, there were two theaters, the first being the Municipal Theater, demolished in the 1950s, which became a comparative reference for the design and definitions of the proportions of the entrance to the new building.

The opportunity arises, within this context, to study the Alhambra Theater building as a significant place within the town that contributes to the valorization of the Historical Monument, according to Decree 79 (2009) of the Ministry of Education. This will be done by analyzing its facade, volumetry, and openings, with a critical and reflective approach that reveals unprecedented geometric relationships between its hidden and juxtaposed elements.

Currently, a series of publications is focused on the historical background regarding the building's origin, heritage, and urban value, as well as the typologies and construction techniques used, such as balloon frames, and the use of different types of wood in its supporting structure and foundation, types that arrived at the port as ballast in the boats transporting the saltpeter. The urban image that its façade projects from its location in front of the Plaza de Armas stands out. In addition, a series of technical reports have been generated with onsite surveys for the building's fitting out. Commissioned by the Directorate of Architecture of the Ministry of Public Works (MOP, in Spanish), they included critical and pathological assessments of the current situation, including proposals for alternative uses with its rehabilitation.

Among this study's objectives is to look closer at the geometric, volumetric, and architectural intentions in the facade, vertical symmetries, and compositional elements, which previous studies have not addressed. The idea is also to reveal how the different structural proportions of the cross-sections of the theater nave directly match the facade. On the other hand, the plan is to determine the coexistence of complementary architectural programs, which have the potential to configure a large facade that transcends and magnifies the image with which this building's guise is recognized today.

Observing and analyzing the rectangular frontality of the Alhambra Theater raises the question: Why was the building's programmatic reality hidden behind a unitary facade? The research focuses on recognizing the presence of architectural elements that manifest binding languages, which need to be revealed, to uncover a new approach embodied in its structure.

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A way to immerse oneself in the search for these formal intentions and features in the building is to reflect on and review images, photographs, and planimetry that allows comparison with the Municipal Theater, and architectural observation, leading to possibilities for new geometric discoveries and programmatic orders.

THEORETICAL FRAMEWORK

The approach to this research is based on showing the qualities found on the Alhambra Theater's façade, through architectural observation, and its use is as a language that can recognize and investigate its singularities. In this regard Puentes Riffo (2013) states that "(...) the sense of observation is itself a structure of perceptions and analysis that formalize a criterion or point of view as a judgment about something (...)" (p.62), in turn, this expression is complemented, taking into consideration the personal interests and concerns of the person making the observations: "This observation is a subjective language that accounts for how its observer thinks (...)" (Vergara-Valverde & Pérez-Lancellotti, 2024, p.124), by generating a methodology of study and approximation to a new reality contained in the building's formal configuration. Cruz Prieto (1993) states the following,

> "Observing would then be an activity of the spirit (and body) that allows us to access, over and over again, a new, unprecedented vision of reality. Observing, in the sense we are considering it, truly becomes an opening."

Observation necessarily requires some time to contemplate carefully what one is facing. It considers diverse resources and formats, from planimetric surveys, photographic records of the period, and from today, with an analytical, but at the same time reflective view. Here, Cruz Prieto (1993) also points out that: "Because Observation – as we said – is that penetrating look that will reveal the reality in which the work will be inserted and that it must house" (p.3), to try to generate a finding or discovery of orders that may be contained on the facade, demands the ability to name it and make it tangible through the construction of a drawing and annotations: "It is not then about looking to draw; it is first about admiration, about looking to observe and drawing to notice the observed" (Silva, 2016, p. 66), so that, in this way, it can be retained and made its own, show it and make it evident to others. Thus, it is necessary to consider some definitions offered by Boris Ivelic: "Observare ob-servare, ob is equivalent to 'there', 'in front'; servare, 'to keep something intact without it being lost'; ob-serve is also to contemplate. Observation is a contemplative act" (Ivelic, 2022, p.23). Consciously, this act of contemplative observation should lead to a kind of praise about these newly revealed realities, which allows developing the capacity for reflection and wonder.

On the other hand, the Georgian style, representative of England from mid-1714 until 1830, exhibits elegance and symmetry as its greatest characteristics: "And the Georgian style, albeit noble and solemn, is of a

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manifest and deliberately modest simplicity. (...) The facade is organized symmetrically around the entrance, which is usually at ground level or slightly above it (...)" (Ching, Prakash & Jarzombek, 2013, p. 152).

Regarding the series of juxtapositions, it is necessary to investigate the meaning and origin of the term, which in Raffino, Editorial Team, Etecé (2021) is defined as recognizing that: "(...) it comes from two different Latin voices: iuxta, translatable as 'next to', and ponere, 'to place'. Thus, the things juxtaposed are somehow coordinated, annexed, integrated, or simply one placed on top of the other" (para.2).

This opens the possibility of asking about the meaning of architectural observation, which can investigate and expose the uniqueness and virtuoso orders contained in the facade of the Alhambra Theater. This allows one to identify the Georgian symmetries, the programmatic juxtapositions complementary to the theater, such as the residence and the pastry shop, as well as the structural geometries that are redrawn through the profiles of the openings, revealing how a series of intrinsic languages linked to a unitary volume converge.

METHODOLOGY

This study will use a qualitative methodology. The observation results will be systematized from the three perspectives presented by the study: the geometric analysis, the symmetry patterns of Georgian architecture, and the complementary programmatic juxtapositions. This allows elucidating how a larger façade, recognized in a unitary way, is achieved.

On the other hand, in addition to the information obtained from the cited bibliographic sources, a semi-structured interview was held with one of the theater manager and builder's grandchildren. Information was collected about the family's daily activities to support each screening or show.

Planimetric surveys were also carried out based on photographs from the time (Figure 1). Superimposed plans contribute to the comparative analysis and revision of the geometric orders presented by the Municipal Theater of Taltal's facade with the current Alhambra Theater, where the similarities in the configuration of the entrances and differences in proportions and magnitudes between the two venues are recognized.

Figure 1. Group of people celebrating September 18th, in front of the city's Municipal Theater: Source: Photographic Archive (n.d). Chilean National History Museum.

The planimetry and structural profiles in various cross-sections of the theater were also examined, along with their relationship with the proportions and rhythms proposed in the façade's design through its doors and windows.

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Figura 1. Grupo de personas celebrando el 18 de septiembre frente al Teatro Municipal de la ciudad, 1909. Fuente: Archivo fotográfico (s.f.), Museo de Histórico Nacional, Chile.

DEVELOPMENT

Since the incipient exploitation and export of saltpeter and the subsequent foundation of the Port of Taltal in 1877, the town grew rapidly, becoming a place with urban infrastructure, trade, services, and commercial exchange. This place also welcomed many people searching for work: "people came there to stock up on provisions or, simply, to socialize in its streets" (Godoy Orellana, 2022, p. 191). This progress was crowned with the construction in 1888 of the Taltal Municipal Theater, located on the corner currently occupied by the Town Hall, in front of the Main Square, the central meeting place of its inhabitants. The early construction of the premises manifests a longing of the community to have a meeting space, capable of convening and connecting with cultural progress, which contributes to covering the needs of entertainment and film screenings for the new residents, linking them with the world: "From the Greeks to the present day, inhabitants of towns and cities have turned to theaters, because they have always hosted shows and socio-cultural activities" (Olguín Durán, 2021, p. 21-22).

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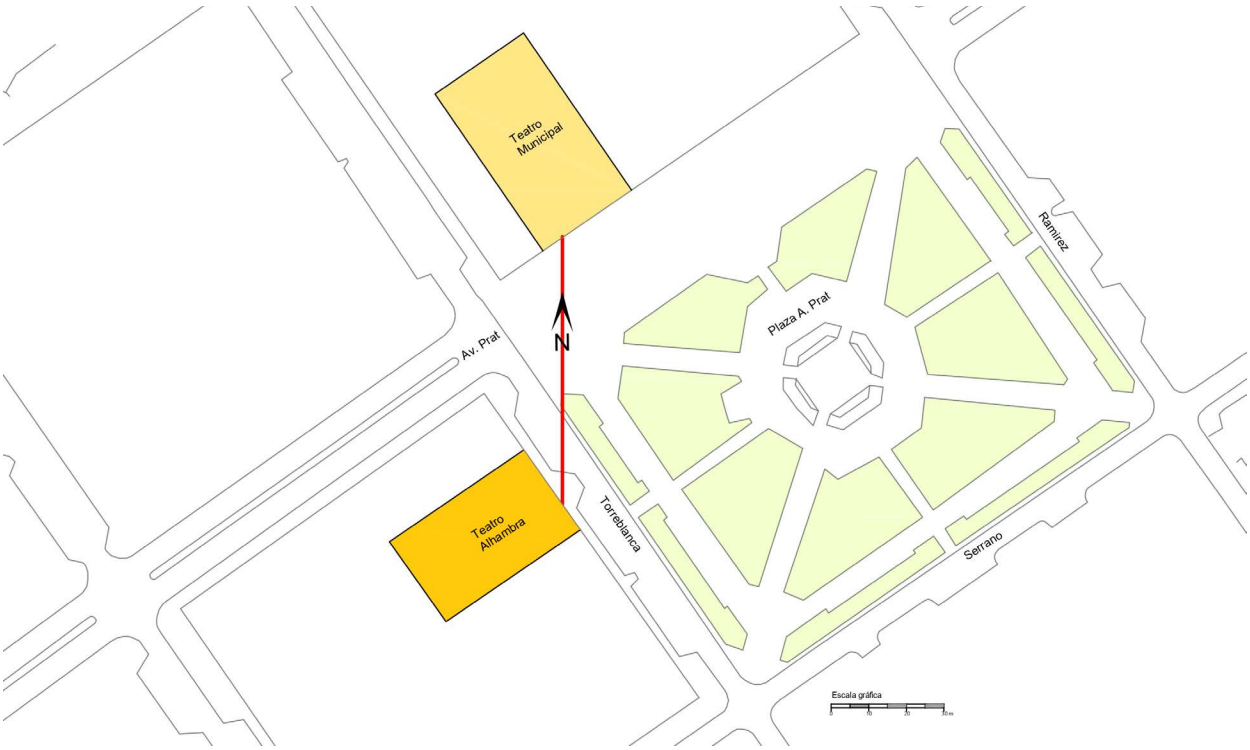

Figure 2. Location of the projects around Taltal's square, binding the facades along the north-south intersection. Source: Preparation by the author.

At the beginning of 1894, a couple, Raniero Perucci and Emilia Giacagli, arrived at the Port from Ancona, Italy. After a while, Raniero would become the administrator of the Municipal Theater. However, after some disagreements with the council of the time, his contract was terminated. As a result, he decided to build his own performance hall, calling it the Alhambra Theater, alluding to a theater in his hometown. This new building would face the square, on a piece of land he had previously acquired.

The Alhambra Theater was influenced by Georgian architecture, incorporating different types of wood in its construction, as described by Aguirre Rojas (2021), "Wood brought as ballast by the ships that came to Taltal to load saltpeter was used for its construction, not only Oregon pine, but also eucalyptus and white pine" (p. 65). The so-called Balloon Frame technique was used, consisting of a structure that has great constructive speed and solidity, using numerous thin slats fixed by nails: "In the "balloon" type structure, which eventually reached an area of 1,500 mt, the subtle two-inch-thick slats seem to lack weight compared to the typical and traditional wooden construction" (Giedion, 2009, p. 368).

Considering that the facade is the first image a building projects, as a representative icon of its exteriorized architectural expression, it presents and continuously projects its vertical volumetry, to recognize its qualities and particularities: "(...) consider the exterior of our buildings, that part that is common to passers-by, and that no man can convert into private property (...)" (Morris, 2023, p. 162). It becomes an opportunity to look closer into studying the singularities and relationships of architectural

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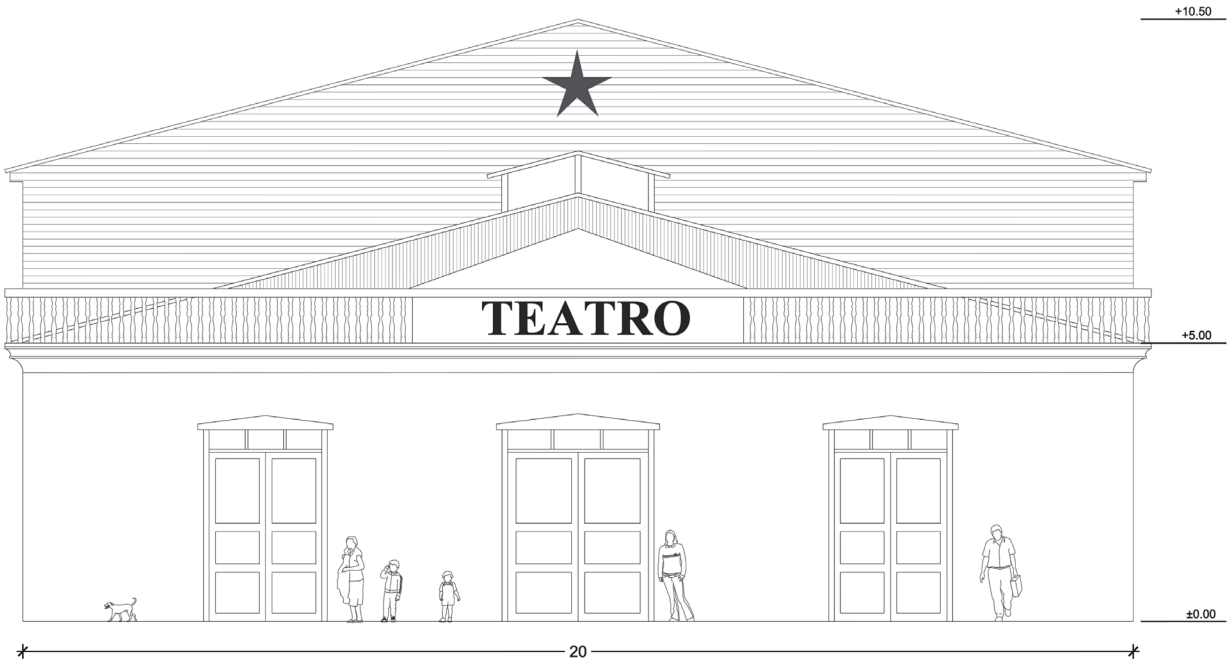

Figure 3. Façade of the Taltal Municipal Theater. Source: Preparation by the author.

orders hidden in the Alhambra Theater's façade from a view that investigates its rhythms and configurations, which are probably conceived from its origin. Recognizing new meanings that can appear from its location in front of the square: "A building is not an end in itself; it frames, articulates, structures, gives meaning, relates, separates and unites, facilitates and prohibits" (Pallasmaa, 2019, p. 75). It provides a reference place for residents to meet and for their entertainment.

The binding origin of *Taltalino* Theaters

The conception of the Alhambra Theater is intimately linked to the Municipal Theater, not only by the typological equivalence and proximity, both are located perpendicular to the square, but also their facades were connected virtually, through an imaginary line given by the geographical north–south orientation (Figure 2). A binding that allows building and recognizing a particular corner of the Square with a vocation for entertainment, accentuated by the intersection of the town's widest street, Avenida Prat: "All of us, to inhabit, need to identify and find ourselves, we need these two dimensions of recognizing ourselves belonging to something..." (Roca, 2006, p. 32). On the other hand, Raniero Perucci, the Municipal Theater's former administrator, would become the builder and owner of the new venue in 1921. From that date, and for approximately three decades, both venues competed to provide entertainment to the inhabitants of Taltal and the saltpeter workers of the interior. This finally relegated the old building to a second plane, being demolished in the 1950s.

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Figure 4. Comparative superimposition of the Municipal Theater's facade over the Alhambra Theater's. Source: Preparation by the Author.

As part of this research, the arrangement of the architectural elements that accentuate the Municipal Theater's symmetry is considered, starting from a gabled roof. Its vertical plane built a continuous single-level rectangular volumetry façade, crowned with balusters. It had three entrances (Figure 3) for the audience attending the functions, allowing them to enter the different spaces selectively, the central door being the largest, leading to the stalls and the two lateral ones to the respective boxes "(...) the art of any era must necessarily be the expression of its social life" (Morris, 2023, p. 129). This balance proposed by the openings gives a hierarchical character to the facade, which brings with it the concept of internal longitudinal axis, around which the premises are programmatically structured, from the crossing of the threshold to access the lobby, then to the seating sector, located in a broader space, facing the stage: "The organizing axis is not necessarily that of a real movement; rather it represents a symbolic direction that unifies a given number of elements among themselves and often relates them to form a broader whole" (Norberg- Schulz, 1975, p 58). These architectural references allowed examining how this volumetric order was extrapolated, almost literally, in the design and subsequent construction of the Alhambra Theater, mainly regarding its facade, where similarities in the volumetry and configuration of the accesses are recognized. (Figure 4)

Programmatic diversity of the Alhambra Theater

Under this premise, the geometric language proposed by the openings on the Alhambra Theater's facade has dimensions of 26 m across from the front by 11.6 m high. It shows two horizontal traits formed by the windows and doors, for each of the floors, separated by a line of balusters that try to be a running balcony, in which it delves

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Figure 5. Façade of the Alhambra Theater and its relationship with the square. Source: Preparation by the Author.

reflexively into the proportions and uses, where the programmatic sense appears within its architecture: "Through these detailed forms, the subtle intermediate stages are organized within the building's large proportions. The particularities determine the formal rhythm and the fineness of the building's measurement (Zumthor, 2004, p. 14). These formal virtues can be recognized through the commercial and residential use programs contained in the facade. These programs complement the theater's activities, where the family is integrated in collaborative participation. This condition of work and family commitment contains in itself part of the reflections that are incorporated in this research, which are described below:

A.- Access to the theater. This dimension considers the occupation of a limited extension of the façade's ground floor, which contains three doors to enter the premises. These doors equally collect the distribution proportion and order of the entrances proposed in the Municipal Theater's façade. This reveals a similarity in how to conceive the way people enter. It was probably a way of appealing to the memory of an identity image of these venues as part of the competitive strategies to capture the public.

B.- Trade area. This place was called the Pastry Shop. It was an adjoining space independent of the theater's entrances that complements the width of the facade on the ground floor. Vertical symmetry is again established in this section of the building, with two side windows as the main points of light entry and a central door, maintaining the same language of the openings. This venue came to

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Figure 6. Unitary facade of Taltal's Alhambra Theater. Source: Preparation by the author.

integrate and strengthen the vocation of the Alhambra Theater by being a social and cultural meeting center, which complements the promenades of young people next to the square (Figure 5), with the possibility of having an ice cream or a beverage, where children could buy cakes and sweets, and adults, cigarettes, before entering each of the functions on show.

C. - Residence. The volume containing the enclosures for family rooms is located on the second floor, directly above the Theater and the Pastry Shop entrance, parallel to the street, which occupies the entire width of the facade.

As part of the facade's language, a door different from the others appears in the central part of the first floor. It is "out of place," smaller, and rectangular in configuration. This door reveals the private access

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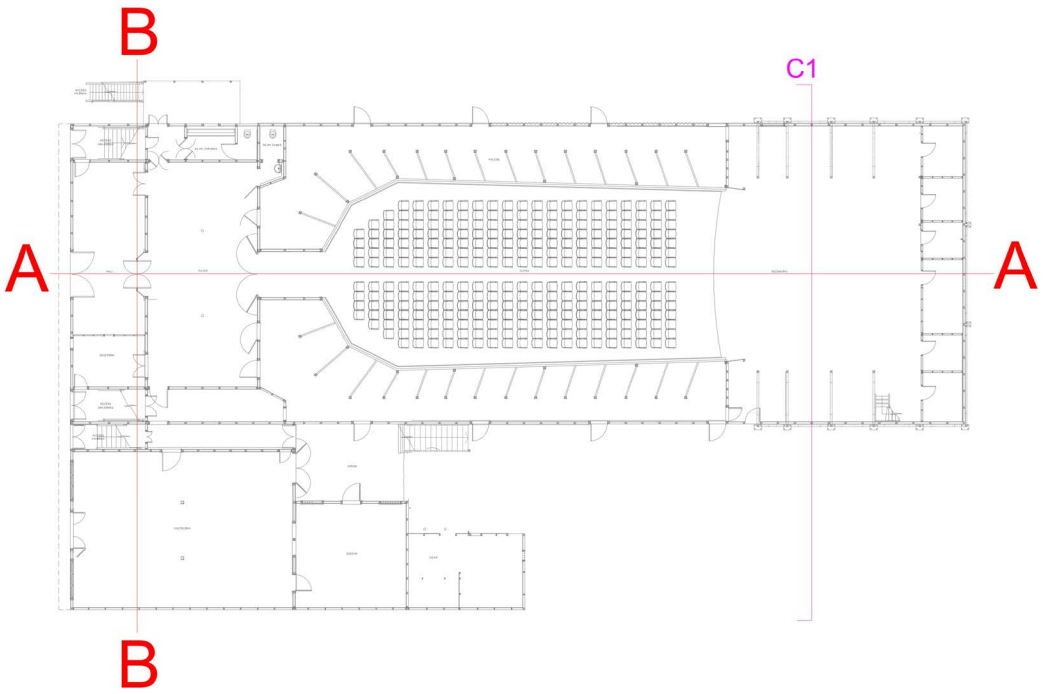

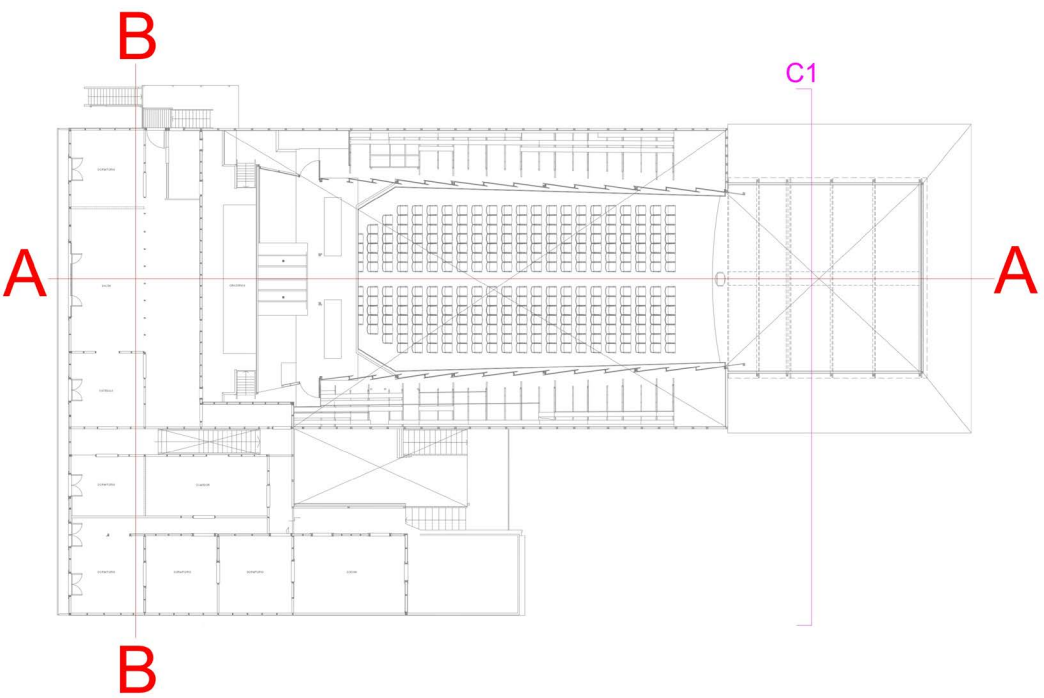

Figure 7. Programmatic floor plan of the ground floor and structural lines of the Alhambra Theater. Source: Catálogoarquitectura, Floor plan: La Alhambra Theater / Taltal. (n.d.). Edited by the Author.

Figure 8. Programmatic floor plan of the second floor and structural lines of the Alhambra Theater. Source: Catálogoarquitectura, Floor plan: La Alhambra Theater / Taltal. (n.d.). Edited by the Author.

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to the family residence by connecting directly with the second floor through a linear staircase.

The windows of the residential volume are configured by recognizing the location and geometries and the openings on the ground floor, by generating concordant axes in their verticality, whose wider window manifests the space where the salon was located, being located on the main access of the Theater, which accentuates its hierarchy.

In conversation with one of R. Perucci's grandchildren (personal communication, May 16, 2023)**2**, he mentions that, as a child, ***he would go to visit his "Nonos" (Grandparents) at the theater, going to the home that was on the second floor called "el Alto". From the salon, through a door that connects with the stalls, you could see and hear the movies projected on the curtain while he had tea with his Nona (Grandmother). This allows you to know whether the movie is about to end so that Nono (Granddad) can go up to eat. Or to recognize if there was a problem with the projection, listening to the audience's noise, or protests by stomping on the wooden floor.*** This story shows the close connection between the intimacy of family life and everyday activities. All the family members were committed to the different functions, from the construction to putting up posters to collecting money at the ticket office, attending the bakery, etc.

With this, a unitary image of the front volume of the building appears, based on three juxtaposed architectural programs, where the use of wood manifests horizontal textures that stand out through the application of paints, following the constructive identity of the era: "Natural materials express their age and history, as well as the history of their origins and that of human use" (Pallasmaa, 2019, p.37), which come to reinforce a formal uniformity of the facade, crowned by balusters throughout its horizontal extension (Figure 6). This strategy of complementarily adding several venues constitutes a much larger unitary architectural dimension than the Municipal Theater.

Structural drawings contained in the facade

A second analysis, referring to the Alhambra Theater's architectural floor plans, has two perpendicular lines that programmatically organize the building. A longitudinal one that considers the hall, foyer and the nave of the area that houses the stalls and the stage (line A), and a second transversal line (line B) parallel to Torreblanca Street, that contains the facade of the building facing Prat square, that is, it supports the most public dimension of the premises, which encompasses the hall, foyer and the pastry shop on the ground floor and the family residence on the second floor (Figures 7 and 8).

2 Conversation with the grandson of R. Perucci, on a trip to the city of Taltal

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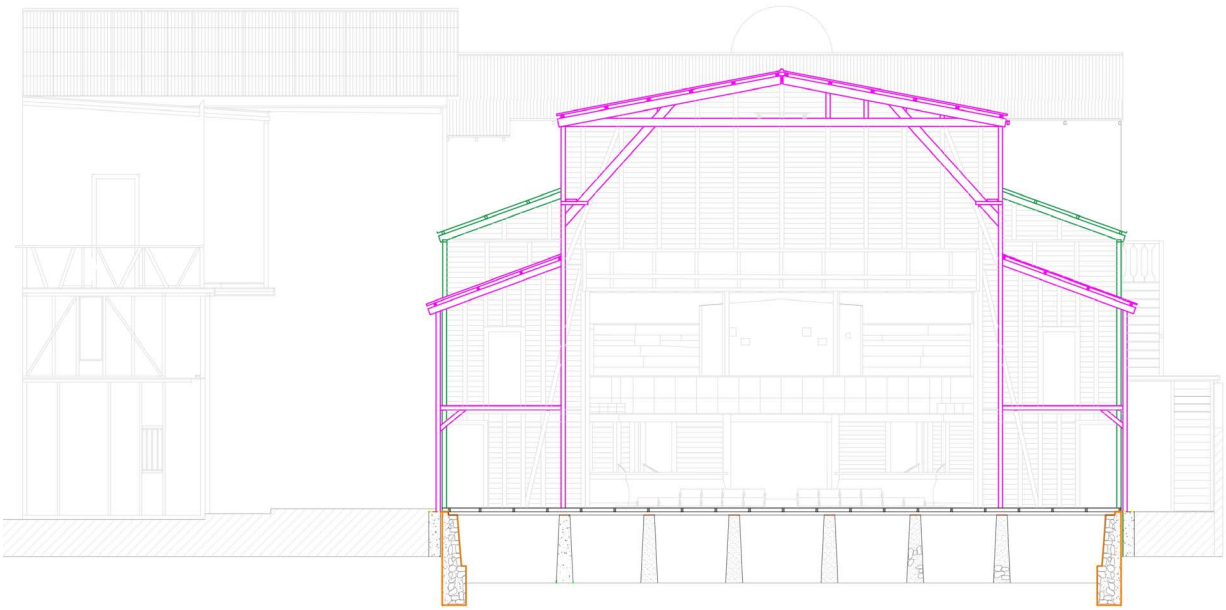

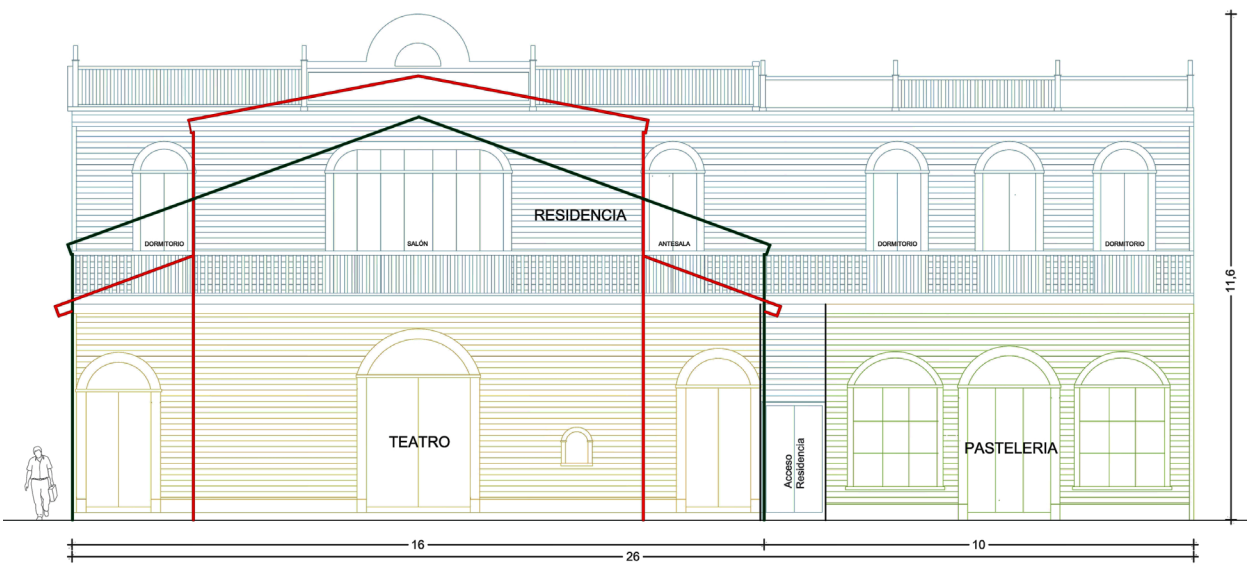

Figure 9. Programmatic floor plan of the second floor and structural lines of the Alhambra Theater. Source: Catálogoarquitectura, Floor plan: La Alhambra Theater / Taltal. (n.d.). Edited by the Author.

Figure 10. Juxtaposed redrawing of the structural transversal profiles on the facade of the Alhambra Theater. Source: Preparation by the Author.

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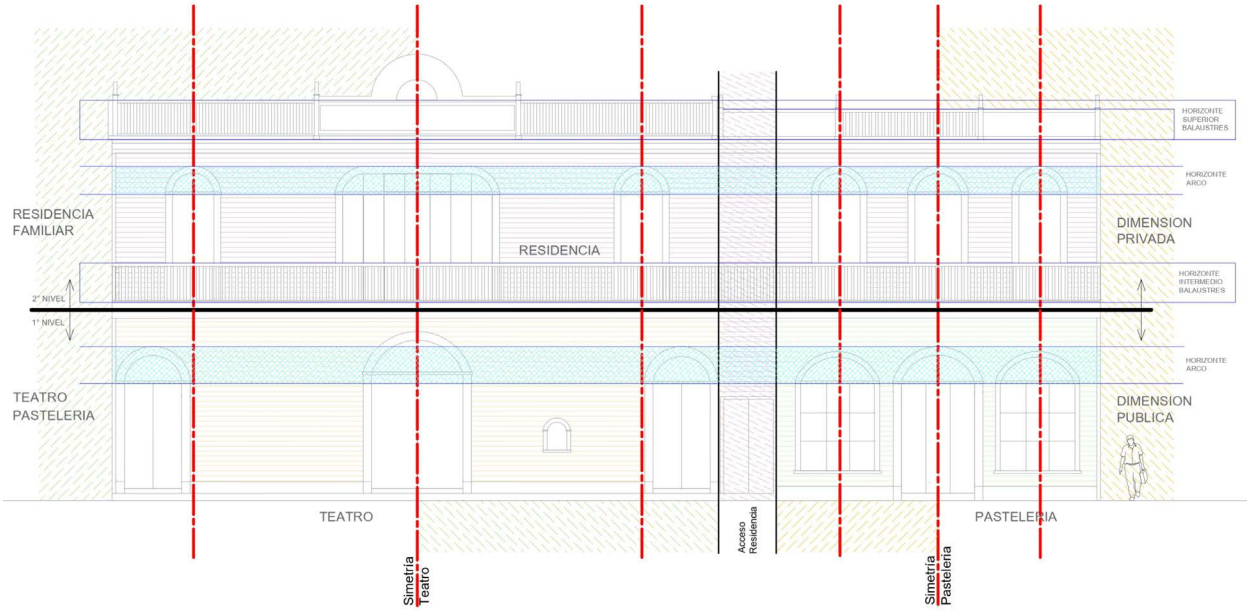

Figure 11. Vertical and adjoining symmetries and horizontal lines of Taltal's Alhambra Theater. Source: Preparation by the author.

The transversal supporting structures of the central nave are recognized from the C1 cross-section made in the architecture plan (Figure 9). The lines of the structural geometric profile are identified from which the superposition exercise is performed on the Theater's facade, revealing that these are implicitly contained in the profiles and levels of the openings, i.e., the transversal structural geometry reappears in juxtaposition on the facade.

When observing the rectangular volume of the front of the building, only one section is for the access; the rest is for the business, and mainly the owners' residence. However, in its architectural conception, there is a willingness to compromise and involve the structural proportions of the nave, bringing them to the fore on the visible side of the theater (Figure 10).

The Theater's design was influenced by the Georgian style, whose main feature is a strict symmetry of its facade, i.e., its predominant order is based on a vertical central axis, accentuated by an access door in the middle and identical and equidistant side elements; in addition, this arrangement extends to the upper floors. This brings a new set of juxtapositions. These two symmetrical and contiguous vertical orders can be read on the facade, where the central axis crosses the facade area for the Theater entrance and part of the family residence. The second axis of vertical symmetry appears in the entrance to the pastry shop and the bedrooms' windows in the upper part of the residence. Two vertical lines are complemented by lines corresponding to the horizontal spans and trellises of the balusters and arches, coming together in a geometric order to constitute a unitary facade (Figure 11).

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CONCLUSIONS

The Alhambra Theater has accompanied the inhabitants of Taltal through a very relevant historical and cultural period, witnessing the city's progress and growth. This research contributes to building a reflection on the diversity of formal and geometric expressions, which recognize various implicit meanings from its facade, arising from architectural analysis and observation. These reveal a series of juxtapositions of hidden internal architectural programs contained in a unitary image, from which the activities directly related to the theater transcend, uniting in one place the possibility of sustaining family life and work, by demonstrating an ability to constitute a binding totality, virtuously expanding the building's rectangular volumetric image.

On the other hand, there is a subtle desire to make the structural section profiles of the central nave appear on the visible side of the theater, through the strategic arrangement and size of the openings' contours.

There is an evident will that this was conceived as a significant urban element, through a vertical frontality that exalts its magnitude facing the public space, which encompasses the horizontal extension of the square, incorporating itself into the recognizable image of the promenade as a meeting place for the ***Taltalina*** community.

However, some signs manifest this hidden programmatic diversity, subtly enunciated within the facade, such as the height difference in the balusters, appearing in various sequences in the distribution and sizes of the windows and doors, the horizontal layouts, and the hierarchical vertical symmetries that house characteristic elements of Georgian architecture.

CONTRIBUTION OF AUTHORS- CRediT

Conceptualization, E.S.A.; Data curation, E.S.A.; Formal analysis, E.S.A.; Acquisition of financing, E.S.A.; Research, E.S.A.; Methodology, E.S.A.; Project management, E.S.A.; Resources, E.S.A.; Software, E.S.A..; Supervision, E.S.A.; Validation, E.S.A.; Visualization, E.S.A.; Writing - original draft, E.S.A.; Writing - revision and editing, E.S.A.

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ISSN Digital 0719-6466

BIBLIOGRAPHIC REFERENCES

Aguirre Rojas, C. (2021). *Teatro Alhambra: 100 años de historia, Taltal 1921-2021*. Editor no identificado

Archivo fotográfico .(s.f.). *Museo de Histórico Nacional, Chile*. https://www.fotografiapatrimonial.cl/Fotografia/Detalle/54633

Catálogoarquitectura. (s.f.). Plano: *Teatro La Alhambra / Taltal. Catálogo Online de Materiales y Productos Arquitectónicos más visitados en Chile*. https://www.catalogoarquitectura.cl/cl/biblioteca/plano-teatro-la-alhambra-taltal.

Cruz Prieto, F. (1993). *Sobre la Observación* [Apuntes de clases inéditos]. Taller de Amereida, Escuela de Arquitectura UCV. https://www.ead.pucv.cl/app/uploads/1993/09/OFI-1993-Observacion.pdf

Ching, F. D. K., Prakash, V., y Jarzombek, M. M. (2013). *Una historia universal de la arquitectura. Un análisis cronológico comparado a través de las culturas: Vol 1. De las culturas primitivas al siglo XIV.* Editorial Gustavo Gili.

Decreto 79 de 2009 [Ministerio de Educación]. Declárase monumento nacional en la categoría de monumento histórico el edificio de los servicios públicos, de Antofagasta y el ex teatro alhambra de Taltal, ambos de la provincia de Antofagasta, II región de Antofagasta. 13 de marzo 2009. https://bcn.cl/3lwsx

Giedion, S. (2009). *Espacio, tiempo y arquitectura. Origen y desarrollo de una nueva tradición* Reverté. https://www.reverte.com/media/reverte/files/sample-81351.pdf

Godoy Orellana, M. (2022). *Estado, Ciclos Mineros y Poblamiento en el Desierto de Atacama: Taltal, 1870 – 1950*. Ediciones del Despoblado.

Ivelic, B. (2022). *El océano pacífico en la visión del maritorio*. Editorial e[ad] Ediciones.

Morris, W. (2023). *Arquitectura*. Pepitas de Calabaza ED.

Norberg-Schulz, Ch. (1975). *Existencia, espacio y arquitectura*. Editorial Blume.

Olguín Durán, A. (2021). *Los Teatros Olvidados. Teatros, cines, pabellones, circos y plazas de toros en Antofagasta (1871-1930)*. Ediciones Pampa Negra.

Pallasmaa, J. (2019). *Los ojos de la piel. La arquitectura y los sentidos*. Editorial Gustavo Gili.

Puentes Riffo, M. (2013). *La observación arquitectónica de Valparaíso: su periferia efímera*. Ediciones Pontificia Universidad Católica de Valparaíso.

Raffino, Equipo editorial, Etecé. (5 de agosto de 2021). *Yuxtaposición - Qué es, concepto, origen, tipos y ejemplos*. Enciclopedia Concepto. https://concepto.de/yuxtaposicion/

AS / Vol 43 / N° 67 / 2025
ISSN Impresa 0716-2677
ISSN Digital 0719-6466

Roca, M. A. (2006). *Habitar – Construir – Pensar. Tipología, Tecnología, Ideología*. Nobuko.

Silva, A. (2016). *La observación en la enseñanza de la arquitectura*. Ediciones Universidad Finis Terrae.

Vergara-Valverde, F. del P. y Pérez-Lancellotti, G. (2024). El croquis y el CAD, socios en el diseño arquitectónico: experiencia en la Universidad Católica del Norte (Chile). *ESTOA. Revista De La Facultad De Arquitectura Y Urbanismo De La Universidad De Cuenca,* 13(25), 165–179. https://doi.org/10.18537/est.v013.n025.a10

Zumthor, P. (2004). *Pensar la arquitectura*. Editorial Gustavo Gili,

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