Lecture Notes in Civil Engineering

Rossella Corrao · Tiziana Campisi · Simona Colajanni · Manfredi Saeli · Calogero Vinci *Editors*

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Preface

The series of technical conferences on Architectural Engineering (AE) annually involve academics and experts to discuss about the recent advancements of the research in the building sector, to find and promote innovative solutions, both at buildings and components scales; to develop building systems and materials, able to improve the energy efficiency of buildings and counteracting climate changes; to ensure the well-being of users by guaranteeing indoor and outdoor comfort; to preserve the building heritage and safeguarding cities, landscapes and territories. Since its beginning in Vico Equense, Naples, Italy, where the first Colloqui.AT.e conference was launched in 2014, the series of conference have been centered on three different Topics related to the main fields of research in Architectural Engineering. Actually, from 2004 Ar.Tec. Scientific Society promoted a series of itinerants thematic conferences focused on: the intersections between architecture and technology (Rome, 2004); the preservation of the building heritage (Tourin, 2006); the design of the building envelope (Ancona, 2007) and of the care spaces, between complexity and innovation (Pavia, 2008); the earthquake and the strategies to remember, prevent and plan (Messina, 2009); sharing technical knowledge derived from the research on building design and construction (Rome, 2011).

Colloqui.AT.e2024, subtitled: "Architectural Engineering in Italy and Worldwide. Comparing Experiences", has also been structured upon traditional and emerging topics related to: "Construction and Conservation History"; "Construction and building performance"; "Building Design and Technologies" that allowed researchers and engineers to discuss at international level the latest developments in AE area. AE aims at providing "tools, methods, and models, including digital ones, for the knowledge and design of buildings, from the critical, systemic, functional, typological, technical, and constructive point of view", by exploiting also the technology transfer from other fields of research belonging to different scientific sectors close to it.

The three topics have been defined as follow:

A_Construction and Conservation History

A1. Materials and construction techniques in historical architecture
A2. Recovery, valorization, and reuse of existing building heritage
A3. Examples of interventions on monumental architecture
A4. Examples of industrial archaeology between knowledge and reuse
A5. Vernacular architecture: lessons learned and future projects
A6. Projects and policies for the regeneration of historic centers and suburbs
A7. Digital twins and immersive visualization for the valorization, management, and fruition of historical building heritage

B_Building Construction and Performance - Vol. 2, ISBN 978-3-031-71862-5

B1. Traditional and innovative technologies and materials for buildings
B2. Modeling, simulation, and diagnostics under uncertainty for performance control
B3. Building pathologies and intervention strategies
B4. Building-human-environment relationships: extended accessibility
B5. Building management and maintenance for safety and quality of living environments
B6. Mitigation and management of vulnerabilities and risks for the preservation of the built environment
B7. Regulatory updates, quality control of the project and construction process

C_Building Design and Technologies - Vol. 2, ISBN 978-3-031-71866-3

C1. Form, technique, and technology
C2. Circular Design, Embodied Carbon, and extended buildings life cycle
C3. Digital transition and design of 4.0 buildings
C4. Technological innovation: processes, patents, and products for the construction of the future
C5. Integral and participatory design for the quality of the built environment
C6. Adaptive and responsive buildings
C7. DfMA—Design for Manufacturing & Assembly and DfD—Design for Disassembly

During the conference, 9 selected papers (among the 145 scientific contributions received) and three keynote lectures have been presented. The three volumes collect all submitted and double-blind peer reviewed papers as well as the contributes related to the three valuable key lectures that opened the conference sessions.

More specifically, these three lectures were kindly provided, for Topic A_Construction and Conservation History (Vol. 1), by James W.P. Campbell, Professor of Architecture and Construction History at the University of Cambridge and Director of Studies in Architecture and History of Art in Queens' College, Cambridge, UK; for Topic B_Building Construction and Performance (Vol. 2), by Mattheos Santamouris, Scientia, Distinguished, Professor of High Performance Architecture at University of New South Wales (UNSW), in Sydney, Australia, and past Professor in the University of Athens, Greece; for Topic C_Building Design and Technologies (Vol. 3), by Joachim Eble, Architect, founder and owner of Eble Messerschmidt Partner, Tubinga, Germany.

The research papers collected in these Volumes testify that today AE multi/interdisciplinary approach can effectively contribute to the analysis and solving problems affecting buildings, cities, and the built environment, by suggesting innovative technical solutions/materials/components and strategies, which are able to guarantee the preservation of the building heritage, the well-being of users, and the appropriate actions to counteract climate changes.

The eleventh edition of the Colloqui.AT.e conference has been jointly organized by Ar.Tec. Scientific Society and the Department of Architecture of the University of

Palermo, with the Patronage of: Department of Engineering of the University of Palermo, Sicilian Region, Agenzia del Demanio Sicilia, Provveditorato Opere Pubbliche Sicilia e Calabria - Ministry of Infrastructures and Transport, Confrestauro Association. The conference was also sponsored by: BCI Bautechnik Group Srl-Buffa S.r.l. (www.buffa.eu), CNT- Domodry S.r.l. (www.domodry.it), INNOVA S.r.l. (www.innovaenergie.com), MICROGEO S.r.l. (www.microgeo.it), XLAM Dolomiti S.p.a. (www.xlamdolomiti.it/en/), CusenzaMarmi (www.cusenzamarmi.com), Guglielmino Soc. Coop. (www.guglielminocooperativa.it), and S.E.P.A.M. Stone S.r.l. (www.sepamstone.it).

On behalf of the organizing committee of Colloqui.AT.e 2024, we express our gratitude to all keynote speakers, authors, as well as to the members of the international scientific and advisory committees. We also extend our appreciation to all the participants who took part in this important international scientific event.

Special thanks goes to the publisher, Springer Nature Switzerland AG and, in particular, to Pierpaolo Riva, for his support in publishing Colloqui.AT.e 2024 proceedings. This contribution enhances significantly both dissemination and impact of our research activities in the field of Architectural Engineering. As members of Ar.Tec. Scientific Society, we are committed to continuing the tradition of Colloqui.AT.e International Conferences of spreading knowledge, excellence, and innovation of our research works related to the building sector.

Rossella Corrao

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Contents

Modernism Denied. Recovery and Regeneration of the Cinema—Theatre "Mastrogiacomo" in Gravina in Puglia

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Abstract. At the end of the 1920s, the affirmation of sound and the advent of the rationalist lexicon favoured the evolution of cinema from a traditional typology to a functional typology, heralding avant-garde constructive experiments. This evolution coincides with a simplification process already in place in the architectural language that will result in the gradual disappearance of ornamental elements leaving room for elementary surfaces, increasingly clear and enhanced using new materials. The rationalist code will set, for this type, a new architectural and regulatory standard, reaching almost unchanged to the present day. The designers, called to confront the new typology, will refer extensively to theatrical models, not only because the questions to be solved are similar, but because in most cases the construction of multi-purpose halls continues, in which animated projections will alternate with theatrical performances. The definition of the typological and functional evolution of cinema-theatre is analysed in the case study "Mastrogiacomo" in Gravina in Puglia (Bari), avant-garde cinema-theatre, made by architect Francesco De Martino. Cinema-theatre is part of a series of works that from the beginning of the 1930s will be subject to a constant process of upheaval, involving a substantial transformation of both compositional and technological character. The economic sanctions of 1936 and the autarchic economic model, will involve the introduction of new materials and components within the building, improving the conditions of well-being, safety, and liveability. Through examination of this study, highlights the need to recover and enhance the architecture and technological systems of cinema through a multi-scale approach capable of analysing a plurality of information, to preserve the identity of this heritage.

Keywords: Modern Architecture · Recovery intervention · Building construction systems · Cinematografi · Cinema-Theatre

1 Introduction

The 20th century was a period of great historical relevance heralding numerous scientific and cultural revolutions that brought about a profound architectural, technological, constructive, and normative renewal, promoting a modern civilisation. The Modern is,

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therefore, a 'presence' dense with meaning and a great lesson because of that peculiar relationship with history that placed the idea of progress understood as continuous challenge and change as an artistic foundation. The intense audio-visual propaganda, corroborated by the traditional magazines, slogans, posters, songs, and powerful speeches to the people, was the means through which politics used to convey to modern Italian civilization the unity between the regime and the Italian people, supporting the concept of a 'national community' in which individual interests were subordinated to those of the nation. It is precisely with this consensus in mind to 'make a virtue of necessity': the policy of the Fascist period, in fact, launched a mighty campaign to build new cinemas that would be added to the regime's vast array of social and representative works, sanctioning not only the close link between state and people, but exalting the supremacy and splendour of the government in international fora. In this showcase, in fact, to the expansionist aims beyond the borders of the European powers, an assimilative process between colonising culture and local culture was initiated.

Italian propaganda in the colonies often portrayed colonial expansion as a "civilizing mission," an opportunity to bring or-der, progress, and development to the local populations. This narrative sought to justify the colonial occupation by pre-sending it as a charitable act. Propaganda often emphasized the superiority of Italian culture over those of the local populations. Such an ethnocentric approach justified the imposition of Italian culture on the colonies as part of the process of "civilization," often masking the reality of exploitation, human rights violations, and struggles against occupation. During the Italian colonial period, the cinema was used as a powerful tool to convey propaganda messages, consolidate colonial control, and influence public opinion both in Italy and in the colonies themselves.

Films produced during the Italian colonial period often promoted the image of the "Empire" as a positive force that brought progress, civilization, and order to the local populations. The "Cinema Impero" in Asmara, located in the capital of Eritrea, is a remarkable example of cinematic architecture built during the Italian colonial period. Asmara was one of the Italian colonies in Africa, and during the Fascist era, the regime sought to transform the city through a series of architectural projects. The Cinema Impero, a prominent example of the 'Asmara Style' was inaugurated in 1937 and was designed by architect Mario Messina, who left a significant mark on the design of buildings in Asmara during that period. Another important example is the 'Cinema Roma' (former 'Excelsior'), designed by Roberto Cappellano and Bruno Sclafani, built between 1937 and 1940. The cinema represents the most advanced expression of Italian rationalism in the refinement and use of precious marbles on the façade, an important stylistic feature of Fascist architecture and a reference to the glorious Roman Empire (Fig. 1).

The present research, part of a broader investigation into the architectural heritage of twentieth-century cinemas, focuses on the construction, technological and urban developments that cities have manifested in a period of great experimentation, especially through the application of an architecture that, between technique and form, has expressed an innovative and modern language.

The important aspects of these architectures can be traced back to the products of autarkic derivation, which constitute an interesting field of investigation because

Fig. 1. Photo of the Cinema-Teatro Impero, Asmara (Eritrea), source: architectuul.com; Photo and Prospectus Cinema Roma, Asmara (Eritrea), source: architectuul.com.

they represent the end of a cultural cycle, a mirror of the political-economic order that developed in Italy after the "unjust sanctions", promulgated in 1935. It is with this in mind that the modern architecture of the twentieth century gathers a constant stratification of innovative materials and avant-garde construction techniques, the knowledge and enhancement of which can today represent a solid basis for the reproduction of natural materials or materials deriving from waste.

2 Objective of the Research

2.1 The Architecture of Twentieth Century Cinema as a Modern Expressive and Ontological Capacity

The aim of the research is linked to a broader line of analysis, aimed at the historical and in-depth knowledge of the various technical, typological, and constructive elements that have innate the architectural heritage of the early '900. Almost a century later, part of the heritage is in an advanced state of decay, due to neglect, transformations over time, and the obsolescence of materials and construction components, many of which are the bearers of experiments, albeit avant-garde, incompatible from a physical, chemical, or mechanical point of view today [1].

Since its inception, cinema has been configured as a collective phenomenon whose initial development is due to the great expressive and emotional capacity of the medium, capable of reproducing real images as well as fantastic images that find in the "dark room" the ideal condition to involve the viewer. When cinema acquires its awareness in languages and tools, the cinema presents itself as a place reserved for the consumption of the film product, a pleasant and evocative place, far from everyday life and any form of disturbance. Over time, however, the needs and imagination of the spectator have undergone changes, taking on different connotations compared to those of the spectator of traditional cinema. In this regard, the advent of cinema and the nascent fascist propaganda of the 20th century led to the creation of an architectural typology that is still in constant development. The present research started from the analysis and classification of the typologies of cinemas, particularly those in Puglia and in the province of Bari, which made it possible to determine the differences between properties with the same intended use; Among these, the categories investigated are single-screen, multiplex, multiplex, cinema-theatre, arena, drive-in, auteur cinema, digitized cinemas. Highlighting the transformation that the structural organisms of public entertainment venues (theatres and cinemas) underwent between the nineteenth and twentieth centuries

in our peninsula and overseas and the increasingly widespread use of reinforced concrete in every field of construction that led, even in Italy, to address the issue of fires and seismic phenomena in public places [2]. The previous reasons define a starting point to focus on how the advent of reinforced concrete will also bring with it the birth of new technological systems and patents of materials used in the construction field (especially in relation to the embryonic concept of "made in Italy" and the "circular economy", linked to the protectionist measures taken by the government in office in the early '30s), defining an essential aspect of the methodological process for the knowledge, cataloguing and understanding of that critical-scientific approach that allows to determine recovery interventions for this heritage [3].

2.2 The Cognitive Importance of the Architectural and Constructive Heritage of Modern Italian Cinema

To cope with the constant research on how to recover the varied architectural repertoire of the Italian twentieth century, it is necessary, in addition to having to carry out direct investigations on the property, as a fundamental element in the methodological process of research, to have to carry out archival, bibliographic, and website analysis. The comprehension of the original documentation in the archive, which reproduces material of specific interest (bills of quantities, project tables, tender specifications, etc.), is intertwined with the vision of the sector manuals (conventional sources) within which the technological solutions and construction characteristics most recurrent between the end of the '20s and the second half of the '30s are found. At the same time, this knowledge is integrated and deepened with all the data and reference information on new building materials, which have been proposed directly on advertising posters and on the catalogues of manufacturing companies (unconventional sources) returning a practical knowledge of the products of Italian labour [4]. The interaction of these three tools flows into an "organic" system of information and data, constantly updated, which acts as a valid support for the "de-construction" of these architectures as well as to outline a correct approach aimed at the conservation and maintenance of the assets subject to intervention. The efficacy of this methodological process has been evaluated with its application directly to the case study of the Mastrogiacomo Cinema-Theatre in Gravina in Puglia. Through the process of "de-construction", the relevant technological and construction elements were highlighted and the state of conservation of all the fundamental aspects of the stylistic identity of the property was ascertained, to draw up a recovery and enhancement project.

3 Methodology

At the beginning of the twentieth century, the forms of nineteenth-century theatre continued to live, and still dominated a large part of the artistic stage; alongside them there were some theoretical movements, which tended to modify the traditional forms, which would lead to the evolution of the theatre, introducing new objective conditions, the social environment and influencing the traditional forms of entertainment. As mentioned, therefore, the transformation of the nineteenth-century theatre in the twentieth

century is dictated not only by the use, increasingly on a large scale, of reinforced concrete, in public entertainment buildings (theatres and cinemas), to deal with problems due to fires and therefore guarantee greater resistance to the building, but also to be able to enlarge the space used for the public, guaranteeing a greater number of seats inside the halls. Therefore, the time in which to determine what is appropriately the point, of moral rupture, between the "Italian" theatre and the new way of seeing the halls of the show, is to be found in two parts that define a new material culture of Art. During Fascism, and with the Birth of the Istituto Luce (1924), the rhetoric of the regime influenced the design choices, giving the rooms an unadorned, bare, sober appearance, in line with the rational and functional logic of the projections, thus creating an expressive tension that is in line with both Fascist culture and modernity close to the Futurist spirit; recognizable in the exasperated luminous perspectives full of an avant-garde dynamism that is still current and can be found in contemporary rooms. The enveloping shape of the ceiling, useful for the refraction of sound, and the curvilinear course of the balconies, essential for the optimization of the visibility curve, make the emptiness of the room even more expressive, commensurate with the extraordinary symbolic and visionary prefiguration of many images of films produced in this period [5]. This specific architectural typology was born and took over between the twenties and thirties of the twentieth century, in a period during which architecture represented a fundamental vector for the glorification and ostentation of the cardinal principles underlying government.

The cinemas, in fact, have become a tangible testimony of a moment in the history of "consensus", which immediately absorbed the canons of the rationalist architecture of the time, deeply linked to the indissoluble oxymoron of grandeur-lightness of the early twenties, which led to the constant abandonment of classical dictates, such as sumptuous, redundant, and non-functional. It was only with the construction of the Cinema Corso in Rome, by the architect Marcello Piacentini, that the definition of an artefact began that recalled, in the interiors, the canons of lightness of rationalism but embodied classical residues in the external facades. This will be the starting point of the monumental style in the Cinematograph building, that will allow architects to improve the way of designing the Cinema and enjoying the "Scenic Architecture".

4 Study Case: The Cinema-Theatre Mastrogiacomo of Gravina in Puglia

4.1 The Birth of a New Typology: The Cinema

The building expansion outside the walls of the city of Gravina in Puglia - started after the Unification of Italy and characterized by the prevalent use of a "Murattiana" type mesh like the model of the city of Bari - is confirmed with the urban design designed by the Regulatory Plans approved over time.

For this reason, the territory has an organization oriented around the urban center, in which the modern infrastructural and production system is grafted. Recent forms of settlement, often decontextualized, have relied on the historic canter of the city, which is well compact and concluded, as well as rich in identity, aesthetic, and economic values [6]. It is starting from these urban changes, which took place during the Fascist twentieth

century, that the city of Gravina in Puglia gave proof of remarkable activism, to the point of being pointed out by the Fascio Provinciale itself as "exemplary for its initiative and commitment to works of public interest" (Fig. 2).

Fig. 2. Examples of some important cinematographs: A) Gravina in Puglia, Cinema-Teatro Mastrogiacomo, Arch. F. De Martino, 1938–1941, photographic archive, source: www.esserealtrove.it; B) Gravina in Puglia, Cinema-Teatro Centrone, Impresa edile Girolamo Candido, 1947, source: www.barinedita.it; C) Matera, Cineteatro Duni, Ettore Stella, 1949, source: www.atlantearchitetturacontemporanea.cultura.gov.it, D) Asmara, Cinema Impero, Mario Messina, 1937, source: https://architectuul.com

An important reference point within the development of the built fabric of the ancient nucleus of Gravina in Puglia is the Mastrogiacomo Theatre, a singular example of theatrical architecture. The character of this architecture is manifested both in the treatment of the external surfaces and in the modelling of the interior spaces. The façade built on the current Piazza A. Scacchi, which marks the perimeter of the ancient core of the city, is interrupted by the decisive presence of the main façade of the theatre, which renounces any compositional link with the buildings that flank it, thus affirming its own historical-architectural identity (Fig. 3).

4.2 The Historical and Architectural Events of the "Mastrogiacomo"

The Mastrogiacomo Cinema-Theatre was commissioned by Michele Mastrogiacomo, who began construction in 1923. Originally, the building was characterised by a masonry structure made of calcarenite blocks and the interiors completely made of wood in Italian Art Nouveau style (Liberty).

Through (historical) photographic support, it was possible to deduce the distribution of the first cinema project. The construction consisted of a pair of staircases that connected with the elliptical stalls on the upper floors, emphasising the view of the stage

Fig. 3. Historical evolution of the Mastrogiacomo Cinema-Theatre: A) External façade of the Cinema-Theatre 1927–1938; B) External façade of the Cinema-Theatre 1938–1954; C) External façade of the Cinema-Theatre 1954.

and guaranteeing optimal sound diffusion, and a rhythmicity marked by cast-iron pillars decorated with floral motifs, which, in addition to supporting the wooden floors, served as technical shafts for the electrical system. The ceiling of the structure had an arched shape, the shape chamfered at the corner ensured sound amplification and less reverberation to allow "the Opera" to reach the highest and most distant point of the hall. On the outside, the 1929 building had a façade in continuity with the building next to it, as the residence of the building's owner. This solution of continuity is perceived by the presence of mouldings that punctuate the façade and hanging capitals that add to its beauty (Fig. 4).

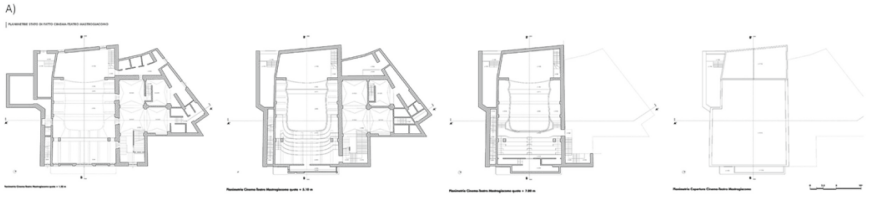

Fig. 4. Graphic drawings of the Cinema-Teatro Mastrogiacomo: A) Plans of the cinema theatre as it stands.

The base was made of bush-hammered limestone that formed a robust 'crepidoma', as in Greek temples, projecting out from the rest of the structure, which was entirely covered with rough stone material.

In 1939, the Mastrogiacomo underwent its first major transformation: a ministerial decree was passed (Law no. 710 of 25 April 1938) that prevented wooden structures from being used in public places because they were a fire danger. Therefore, the demolition and reconstruction in reinforced concrete of the Cinema-Theatre was a must, which was the first to be carried out in the municipality of Gravina. From a technical point of view, the Cinematograph is articulated with a reinforced concrete framed structure, which sits elegantly and well thought out alongside the 19th-century building; to facilitate vertical connections for access to the balconies and the projection booth, a staircase made entirely of reinforced concrete was placed not inside the auditorium, but in the Foyer (a term that would be used from the mid-1950s for the space in the cinemas where the ticket office and entrance were located), in combination with the main entrance and the bar area to welcome the people. [7].

The inauguration of the refurbished building took place in 1941, the projection booth was moved to the second floor while tiered seating and six side boxes, three on each side, were placed on the first. It could accommodate 612 spectators, 327 in the stalls and 285 in the gallery. It was equipped with dressing rooms set up in the under-stage area and others on the stage floor, on the right side of the stage.

The language that was preferred in the design and realisation of the building was linked to that of the old system, in the roof, the curvilinear trend was maintained to favour more sound to the structure, guaranteed by modern materials such as "Populit" and "Eraclit", used in film factories for their acoustic and thermal insulation qualities. Also on the roof, the unofficial enactment of the national ban on smoking in enclosed spaces led to the design and construction of three pyramid-shaped skylights, which not only provided light in the cinema, but also allowed cigarette smoke to escape during crowded moments in the auditorium.

Later, these devices were removed to be replaced by a latero-cement floor, allowing for horizontal continuity of the structure and greater soundproofing, as a direct prerogative of the performing arts venues to favour greater care in audio-visual reproduction (Fig. 5).

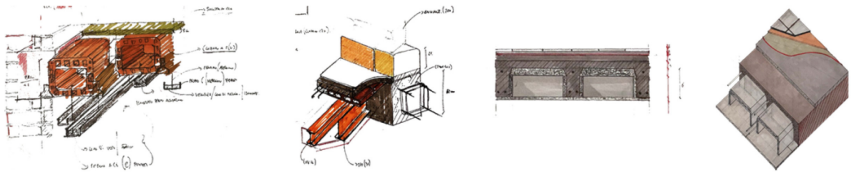

Fig. 5. Sketches of the technological systems found in the Mastrogiacomo Cinema-Theatre: "Torino TP" type floor with false ceiling, "Ipe" beam substructure supporting the balconies, two-dimensional and three-dimensional restitution of the "Eraclit" Cinema-Theatre floor.

The use of the mixed structure for the realisation of the building brings with it a twofold motivation: on the one hand, it fully embraces the technological characteristics foreseen by the government in a period of transition and experimentation in the field of new construction systems (the use of reinforced concrete inside the public premises and the creation of a mixed structure followed the prescriptions foreseen for the realisation of works in that period); on the other hand, the presence of diversified technologies is linked to the two different functions that the architect wanted to assign inside the building, i.e. recreational and monumental (Fig. 6).

In using the mixed structure, architect De Martino determined that he wanted to unite the two buildings in an indissoluble union to ensure a greater relationship between them, in a condition of perfect continuity. Through the detailed archival research conducted and the correspondence validated during the on-site inspections, it was possible to identify two different types of horizontals, "Torino TP" and "Eraclit", used for the roofing respectively. The 'Torino TP' floor consists of precast prestressed concrete joists in the shape of an inverted 'T' (with the possible variant of the intrados with a brick bottom). They were spaced 55 cm apart (hence the name TP 55); a perforated brick element was

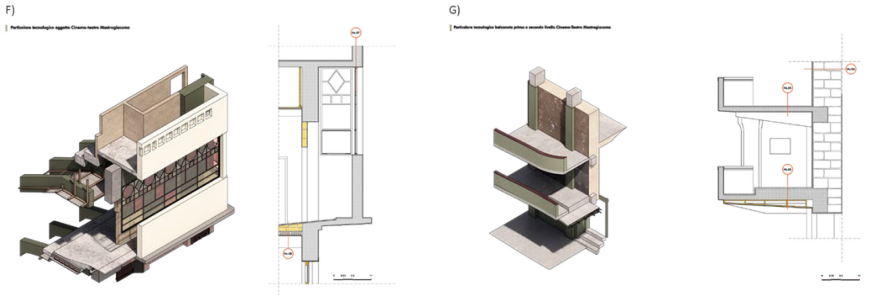

Fig. 6. Graphic drawings of the Mastrogiacomo Cinema-Theatre: B) Main Cinema-Theatre Elevation; C) Rear façade of the cinema-theatre; D Section A-A' Cinema-Theatre; E) Section B-B' Cinema-Theatre; F) Axonometric and two-dimensional detail of the Cinema-Theatre projection; G) Axonometric and two-dimensional detail of the Cinema-Theatre balcony.

placed between them, with heights ranging from 12.5 - 16.5 to 20 cm. These brick elements were supported on the joists by means of two lateral fins; the solidification of the block took place by means of a concrete casting to form, in addition, small orthogonal ribs, thanks to the morphological conformation of the upper part of the brick block [8].

The use of this ceiling was especially indicated for very complex structures and to cover very large spans, as well as to promote greater thermal and acoustic performance due to the presence of the cavity.

In the case of the Cinema-Teatro Mastrogiacomo in Gravina in Puglia, the type used was the Torino TP 55, as the closure for the skylights in 1938.The second type of attic identified is the "Eraclit", one of the patents developed between the end of the 1920s and the early years of the following decade, an emblematic case being the one presented by engineer Ettore Munaron in 1932, which replaced hollow brick blocks with Eraclit channels [9]. For this specific type of attic, the laying surface consisted of Eraclit slabs placed close together and placed in the direction of the largest span, and on it were laid, transversally to the slabs, the channels, also made of the same material, without fixing them with nails. Eraclit channels were produced, according to Moneron's patent, with a length of 1 m, a width of 30 cm and different heights (18-22-24 cm). Narrower special pieces were used at the points where the slabs were fixed in the masonry, allowing the ribs to be widened.

Reinforcements were placed between the channels and then the entire slab was sprayed with cement grout before the casting was carried out, which filled the ribs and formed the slab. Once the stripping had been completed, the joints in the ceiling were sealed with gauze before the plaster was applied. The use of this material allowed for a strong economy of iron, reduced waste as Eraclit's channels were not prone to breakage and avoided the need to apply special floors and additional insulation layers. The advantages of this attic were speed of laying, the reduction in material waste and the possibility of achieving greater thermal and acoustic insulation, with a lighter slab [10] (Fig. 7).

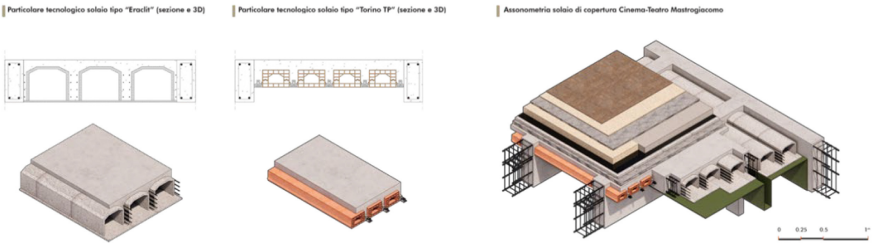

Fig. 7. Axonometries, technological details of the "Eraclit" and "Torino TP" slabs; Axonometric reconstruction of the cover of the Mastrogiacomo Cinema-Theatre.

4.3 Modern Materials: The Authority of the Product

The Mastrogiacomo Cinema-Theatre, if it responded on the one hand to the canons linked to the materials and technological systems developed during the Autarchic period, on the other hand submitted to the principles of a regime architecture that imposed the use of local materials as a contribution to the definition of a rationalist language, embodying the transparency and purity of the regime.

The panorama of materials and artefacts produced in Italy during the war years is a field of study of great interest because it represents the end of a political and cultural cycle. It reflects the economic conditions that developed in Italy with the 'unfair sanctions' promulgated by the League of Nations in November 1935 due to the war in Ethiopia. The Cinema-Theatre can be a starting point for material research of the "Made in Italy" products used for the realisation of this artefact, going through each single material based on the most important architecture and design magazines published between 1930 and 1950, a heritage of references of the excellence of Italian creativity. The main feature that immediately comes to the fore when studying this artefact is the creation of a building that stands out architecturally from the facades of the buildings that flank it, imposing itself as a fulcrum in a neuralgic area of the city. An action that, in the years of its construction, was carried out by the Fascist State with self-sufficient propaganda and awareness of the use of national products. An emblematic case within the cinema is the use of "recycled" Ipe profiles, obtained from the waste of other constructions, for the structure of the balconies, creating a unique technical and technological system.

Other materials found in the complex, which refer to the earlier mentioned period are, the "Buxus" used for the coating of the structures and interior furnishings, the floors in "Linoleum Prealino", which allowed to have a solid and consistent footboard and resistant to wear and the use of Terranova plaster for the exterior facades as the embodiment of the ingenuity of time in creating paintings resistant to the rush of time. One of the richly used materials inside the building is the "Eraclit", sound-absorbing and insulating material, born to absolve the absorption of sound waves within the cinemas and that allowed to create coverings articulated and in line with the idea of time lightness and monumentality.

For this and for other principles and actions peculiar to the closed market as it was defined after 1936, the Italian autarchic phenomenon has been defined "an innovative laboratory of ideas" anticipating the green economy and the contemporary recycle design,

the phenomenon of makers, relaunching the craft sector and integrating industrial and traditional products [10]. A question that, together with the relationship with history, is a common thread of Italian architecture and design culture, as it began to take shape in 1925 [11].

The previous treatment does not aim to be exhaustive; rather it addresses the issue of materials and technologies that, although introduced by economic and political factors, have influenced the architectural and technological processes in the building, and how, these systems, to date can be rethought and re-evaluated in a new development key to implement the knowledge and improve the recovery.

5 Conclusions

In the years after World War II, when the film industry is experiencing a new moment of revival, there will be an extremely creative season for monumental and rationalist architecture. To enhance this heritage, which represent an important 900' architecture like a clear reference for contemporary architecture, today we are facing a real critical point, determined by the impossibility of recovering this heritage without distorting it of the Modern "values" of which it is steeped (Fig. 8).

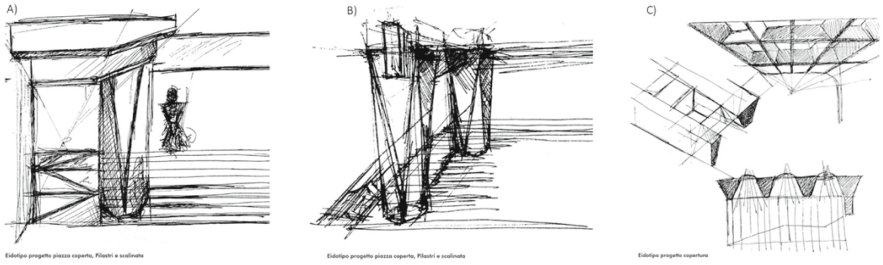

Fig. 8. Sketches Cinema-Teatro Mastrogiacomo recovery project.

The modern is therefore a presence full of meanings and a great lesson because of that peculiar relationship with history that, only apparently introduced, laid the foundation of artistic production the idea of progress, understood as fast forward movement in space and time and as challenge and continuous change. A fact that already in the age of mechanization contained many of the characters that lead our contemporaneity to reflect on the need for a project capable of combining the terms of conservation with those, accidents, recovery, and enhancement. This requires mature attention and sensitivity but does not censor or renounce innovation-oriented solutions, in response to changing social and functional needs. Long gone by the logic of the codified solutions of the manual practices and the best practices, the conservation involves the deep acquaintance of the assets of which the artifact is constituted, the analysis of the state of maintenance of the work, the control of techniques of intervention, the close understanding within the limits of the protection. All this to lead to the identification of the "measure" of the transformation in the relationship between choice of the intended use compatible in the

definition of the modern design, proceeding in compliance with the current regulatory framework [12] (Fig. 9).

Fig. 9. Axonometric exploded view, new shell with different uses; Project drawings for the restoration of the Mastrogiacomo Cinema-Theatre; Project views.

The "de-construction" of the Cinema-Theatre Mastrogiacomo has allowed us to verify the effectiveness of this methodological process, which allows us to relate to the need to know the modern heritage to enhance these architectural specimens. To this end, the vision of the archive material has been validated, which represents a strong starting point towards the understanding of the work under study, returning the original project to acquire all the information that in some cases, it is more difficult to make an intuition following subsequent interventions. In conjunction with the critical analysis of the technical and technological system of the building, the study of the sector manuals and in situ surveys represent further elements of verification that allow the control and comparison of archival data with the status of the work.

In this context, the theme of the "restoration of the Modern" goes far beyond its theoretical and technical definition if it intends to refer to the complex and difficult reality of our heritage in an active and not only defensive way. Beyond the schools of thought and the methods experimented in the cases carried out, the issue can be defined, in a nutshell, as the "measure of the project", knowing full well that even the intervention marked by maximum conservation, inevitably, transforms. In this perspective of regeneration, the idea of recovery and enhancement is even more validated, practices that could generate new interests today, while ensuring a process of historical-cultural continuity and interaction with the community that uses the work, opting for uses that are also different from the original ones. Museum spaces, cultural hubs, "places of memory" and many others are the new "reuses" that make it possible to reconcile the themes of conservation and re-functionalisation with those of historical memory, compensating for the needs of contemporary society through interventions and materials that in a congruous way, mediate between the "new" and the "old".

In this direction, the Mastrogiacomo Cinema-Theatre has been identified as a striking example of enhancement of the historical aspects, memory, and new identity of the building in relation to the cultural importance it represented for the city of Gravina in Puglia. To this end, an idea of redevelopment was analysed, highlighting the typological,

architectural, constructive, and functional peculiarities of the building, transforming it into a social catalyst capable of being experienced by all citizens, with the aim of reconnecting the building to the city. In particular, the project is based on two main aspects: the punctual demolition of the stage with the elimination of the entrance portal of the cinema, which will ensure the definition of a new connecting volume of the building and the creation of a covered square.

The structure of the new envelope will be defined by pillars set back from the projecting reinforced concrete slabs to give a global suspension to the building, which will remain detached from the walking height, to create a slit capable of attracting the visitor's attention. The new volume will have different uses in which the community can meet, it will be divided into four floors with a bar, bookshop, exhibition hall and administrative floor. The project idea is based on the creation of a new space dedicated to conviviality for citizens. This process of addition could give a new identity to the artefact, without distorting its historical one. The intervention, defined as an operation of "peculiar functional recovery", is characterized by a volume covered entirely in semi-opaque polycarbonate, which will allow the structure to remain eternally light to the eye and capable of thermally insulating it from possible thermal bridges. An intervention, which opts to emphasize the golden symmetry with which the cinema was originally designed and which, with the use of "light" and prefabricated materials, constitute an element of recognisability of the intervention (Fig. 10).

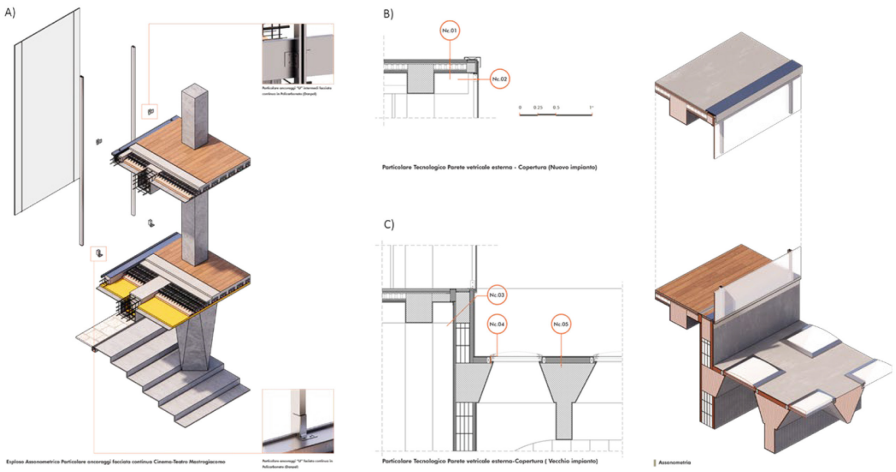

Fig. 10. A) Axonometric exploded view of additional volume new project; B) Three-dimensional and two-dimensional detail of the anchoring of the façade and the roof of the new volume; C) Three-dimensional and two-dimensional detail of the anchoring of the façade of the new envelope and the slab of the old system

The main purpose of using a light and translucent exposed structure is intended to entice the visitor to enter the building and to allow sunlight to penetrate inside the different rooms.

The covered square will have an internal "Agora" and, in the back part, stairs that will allow the relationship between the medieval layout of the historic centre and the city; in this area there will be "sculptural columns" that will guard the entrance behind the square. The relationship between the square and the historic structure of the cinema-theatre will be guaranteed through windows in the foyer, where there will be a bar available to the visitors. Also in the old part, the stairs will allow access to the first level of new auditorium will remain unchanged. The auditorium itself will not only be a structure that will allow film viewings, but it has been designed to guarantee a place capable of hosting conferences. The new roof, in the auditorium, is a "classic" reference to a lacunar false ceiling with splayed elements that will consent light to enter the theatre creating games. In addition to the project, it will also be possible to redevelop the foundations of the old cinema. In these, there will be a permanent exhibition dedicated to the Cinema in its historical evolutions highlighting the characteristics of which "Gravina Sotterranea" is the holder. Gravina sotterranea is the name that defines the spectacular underground network of tunnels that winds through the city and that defines a historical, cultural, and architectural heritage capable of reading the history evolutions of them. The result of this recovery project will create an "Urban Filter" that can allow an easily reuse the architectural artifact as a new point of reference for the community.

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