# Imagining Structures. A Historical Investigation About the Works of the Engineer and Architect Enrico Castiglioni in 1950s Italy.

Imaginando estructuras. Una investigación histórica sobre las obras del ingeniero y arquitecto Enrico Castiglioni en la Italia de los años cincuenta.

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RESUMEN

Durante la década de 1950, una "tendencia estructural" afectó a la arquitectura moderna internacional a través de las geometrías de vanguardia del hormigón armado. En el contexto especial de Italia, mientras que las grandes obras de hormigón armado de la ingeniería estructural recibieron la atención internacional, se estableció una profunda afinidad entre la concepción estructural y la arquitectónica en la arquitectura italiana. En este marco, el ingeniero y arquitecto Enrico Castiglioni (1914-2000) desarrolló su lenguaje arquitectónico caracterizado por estructuras imaginativas en hormigón armado. Su obra, ampliamente difundida en la escena internacional a través del relato de las revistas de arquitectura de los años cincuenta y sesenta, está hoy completamente olvidada. Este artículo presenta los principales trabajos de Castiglioni a través de una investigación en el campo de la historia de la construcción.

Palabras clave: historia de la construcción; hormigón armado; estructura y arquitectura; Enrico Castiglioni, Italia.

# ABSTRACT

During the 1950s, a 'structural tendency' affected international modern architecture through reinforced concrete cutting-edge geometries. In the special context of Italy, while the large reinforced concrete works of structural engineering received international attention, a deep affinity between structural and architectural conception was established in Italian architecture. In this framework, the engineer and architect Enrico Castiglioni (1914-2000) developed his architectural language featured by imaginative structures in reinforced concrete. His work, widely disseminated on the international scene through the narrative of architectural journals of the 1950s and 1960s, and today is completely forgotten. This paper presents Castiglioni's major works through an investigation in the field of history of construction.

Keywords: construction history; reinforced concrete; structure and architecture; Enrico Castiglioni, Italy.

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# **1. INTRODUCTION**

In 1960 the engineer and critics Curt Siegel, in the first German edition of his famous essay 'Structure and form in modern architecture" (1), included in the review of the most famous works of the 20th Century, two un-built structures designed by the Italian engineer and architect Enrico Castiglioni (1914 - 2000), listed in world rank of attractive structures for the unusal "structural accomplishment of spaces of great architectural significance" (1).

The inner imagination and the peculiar "ability in inventing structures" (2) of the Italian engineer and architect, had been first detected by the architecture critic of the 1950s.

The first main publication was dated 1955 (3). The occasion was the Italian national design tender for the new building of Naples railway station in 1954: Castiglioni presented a fantasy of vaults that, conceived as reinforced concrete shells anchored on inverted-tripod supports, capturing the interest of the jury, in which the influent Italian architect and critics Bruno Zevi has been involved.

In the attempt to illustrate the particular structural body of the presented design, a series of images of the impressive vaulted roofing (photographs of a study physical model) were attached to the competition reports. One of these images, remarked by Zevi, was, thus, reprinted as the cover-picture (Figure 1) of the first issue of his architectural journal, "L'Architettura Cronache e Storia", issued in June 1955.

Thanks to the 'structural tendency', which was affecting modern architecture through reinforced concrete cutting-edge geometries, the iconic cover-picture was been a powerful tool to shed light on Castiglioni work. Indeed, between the 1950s and 1960s, Naples railway station and furthers Castiglioni projects were widely published by architectural magazines (4-10), spreading all over Europe and reaching even in Japan.

# 2. STATE OF THE ART AND METHODOLOGY

Despite the success of the time period, since the end of the 1960s, Castiglioni's work was suddenly forgotten by architectural critics. Called to mind, in Italy, in 1979, when Castiglioni was included in the exhibition "Architettura 2878", alongside Nervi, Mangiarotti, Mollino, Moretti, Ponti, and Scarpa (11), Castiglioni's projects have been the subject of only a few subsequent study, referred only to the field of the history of architecture (12-16).

This study presents Castiglioni's major works, within the research field of history of construction. The broad literature of the time period documented Castiglioni's work only with pictures of the study models and the finished works with few architectural drawings. Thus, the analysis presented in this article is based mainly on archival documentation, relating to the conception process and executive development of the projects. The main sources are the private archive of Castiglioni, which is the only available source for the analysis of the unbuilt designs, and the archives of public local authorities the Varese district, where main works were built. Furthermore, especially for the unbuilt design, design physical models (Figure 1) that are still conserved in the Castiglioni archive, are used as a crucial source to verify and discuss the geometrical and structural conception of works.



Figure 1: Naples railway station design as cover-picture of the Italian journal "L'Archiettura Cronache e Storia" (1955) and of the Polish edition of the book by C. Siegel (1968); Castiglioni's work published in "Informes de la Construccion" (9-11); Naples railway structure physical model in Castiglioni private Archive (CPA).

The following pages are structured as follows. First, the most affirmed structural vision of Castiglioni, the Naples railway station design (1954), is analyzed. Thus, built structures conceived before the Naples railway station design (1951-53) are presented, in comparison with this project. Then, the last projects, dated 1955-64, are analyzed. In conclusion, Castiglioni's structural work is reframed in the Italian building culture of the time period, discussing some of its specifics traits.

# 3. THE NAPLES RAILWAY STATION (1954)

Broadly published in the architectural magazines of the 1950s and 1960s, the structure designed for the national competition of Naples railway station is Castiglioni's most famous project. Presented at the tender with the motto "Tradotta 1954", the project was summed up in the design of wavy shell roof, of plastic and dimensional highlights, combined with loadbearing pillars arranged in inverted-tripod (Figure 2).

Despite the shell that appeared as free-form geometry, the structure had a clear modular genesis. Indeed, as shown by the plan of the roof (Figure 2), it was formed by a regular pattern of triangular, 25 m span, sail vaults - cut, on each side, by sections of ellipses - and hexagonal lens.

Each vault presented three fusiform tie-rods, placed on each side, in order to eliminate its trust and transmit only vertical loads on the pillars head (Figure 2).

Base structural module - that solved the problem of the support system's balance - was the combination of three invertedtripods and four vaults, forming a triangle with 50 m edges (Figure 2). ("Three supports are sufficient and essential for giving rise to architecture", Castiglioni went on to say, years later (14)). Moreover, to ensure the curved geometric connection between the vaults and inverted tripods, the composition of the six vaults formed the lens, consisting of a concave regular hexagonal surface and, the arms of the pillars expand at the top, creating a sort of triangular wedge, also formed by elliptic cuts (Figure 2).

The composition of six vaults formed a regular hexagon with 25 m edges. It evokes the ultimate geometry of the roof - com-

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Figure 2. Naples railway station project: a) study model in wood and plaster, 1954 (CPA), sketch of the structural unit (1); general section of structure and study model in wood and plaster, 1954 (CPA).

posed, indeed, of the assembly of 10 hexagonal modules - and summarises all the distinctive elements of the structure, the inverted-tripods, the triangular sail vaults, the lenses, and the fusiform tie-rod.

The structure was imagined as being entirely built in reinforced concrete, except for the tie-rods, which are conceived in steel and made of copper in the study model (Figure 2). The struts and the lenses formed a very rigid system, whilst the thin vaults - exposed to thermal stresses - are considered as being "light and elastic" and thus free to "breathe" so as to prevent the emergence of secondary stresses. The elasticity of the roof "enhanced by rounding, recesses, incisions, crevices for light" (1) required the support system to have a considerable rigidity: the tripods morphologically embodied this need. Looking at the system from below, the three arms of the tripod have a variable profile enlarging on the supports, to withstand the significant flexion stresses. The three-pronged plinth was designed as a robust polyhedral element, which whilst bearing the entire weight of a single tripod on one side and the possible oblique forces deriving from the variable loads on the roof, does not compromise the harmonious elegance of the composition (1).

The design of the elements of the structure also incorporates the construction details necessary for the life of the structure. For example, the tie-rods presented a Y-shape section and the pillars a V-shape section, in order to function even as a system for the rainwater runoff. In the basin formed by the arms of the Y, the water is conveyed into the cavities of the arms of the tripod. Hence, inviting the waters into the hollow plinth. The morphology of the elements is substantiated by the choice of materials and colors which, for Castiglioni, is an integral part of the spatial image of the structure. For example, the anchoring plinths are covered with the same polished granite as the flooring "to emphasize their action as points of bearing the forces and conversion of these to the underground".

# 4. "STRUCTURAL ATTEMPTS" (1950-54)

When the Naples railway station broke into the international scene in 1954, Castiglioni was 41 years old and he was still unknown in the Italian architectural debate. Born in 1914 in Busto Arsizio in the province of Varese in Northern Italy, with a first degree in civil engineering at the Polytechnic of Milan in 1937 and qualified for the profession of architect in Rome in 1939, he had started his professional activity in 1950 in the land of his birth (17).

Castiglioni first built work was an expansion of the Rosetum institute in Besozzo, designed in 1951. In the project of the complex's new chapel, the concept of the internal space was characterised by the contrast between two structural systems: a corrugated shell roof and a beam-and-pillar frame. The roofing shell comprises a series of ten round transverse vaults, three meters in diameter, made of eight-centimetre-thick prefabricated brick arches set on reinforced concrete beams.



Figure 3. Rosetum in Besozzo, view of the interior, 1953 (CPA).

The succession of the vaults, defined by Castiglioni as a "folded but never rigid sheet structure", therefore rests on the longitudinal beams that run parallel to the perimeter walls and connect to the pillars, forming an autonomous frame (Figure 3).

The same combination of two structural systems (the thin vault and the exposed frame) was developed, with original results, in the enlargement of the sixteenth-century church of Viggiù, designed in 1952, consisting of a new rectangular hall (eight by twenty metres) with small side rooms. The spatial conception of the hall is based on the combined use of a thin, sinuous, reinforced concrete vault with ten hefty tripartite supports (inverse tripods). Seen from the front, each inverse tripod, originating from single support on the ground, consists of a vertical and flared central pillar and two inclined and tapered lateral arms that extend outwards, forming V-shaped support (Figure 4). Thus, if we imagine a transverse section of the structure, the central pillar of the tripod, because it remains detached from the perimeter wall, rises vertically (up to 7.25 metres) to the springer of the central vault while the two arms tilt outwards until they re-join the perimeter wall.

On the one hand, the sequence of V-shaped supports constitutes the lateral support of the system of prefabricated brick arches that define the wavy edge of the perimeter wall above and the roof of the side rooms. On the other hand, the central pillars join the thickest sections of the undulating vault characterised by longitudinal reinforcement, forming the stiffening system of the roof.

In terms of spatial conception, the combination of robust tripods and the thin vault is marked by the placement of large windows that allow a diffusion of light, which grazes the roof curves and underlines the figure of the "strictly static membrane" devised by Castiglioni.

The vault is entirely cast in situ, with the refined carpentry of the impressive wooden centering. A data comparison of the original drawings of the vault's contour lines with construction site Figures showing the complex curvilinear wooden boards placed to support the cast-in-place roof discloses the modular conception of the vault (Figure 4). A single bay between two tripods was designed as a combination of simple geometric sectors: a barrel vault, a small, lowered dome, and a saddle surface between them. The juxtaposition of the vault sectors in each bay with the overall composition of the four bays is thus indicated by the positioning and shaping of the reinforcements; the domes are characterized by circular reinforcements while the stiffening sections of the roof are marked by major transverse reinforcements.

If the affinity of the station building with the structure designed for the small church is evident even when looking only at Figures of the physical model, the similar modular composition of the free-form vaulted roof, reveals in the neglected church hall, a built prototype of the affirmed Naples structure.











Figure 4. Viggiù church, new chapel, 1952-1953. From left to right: interior view, 1953 (CPA), 3D study of the vaults geometrical conception (the author, 2020), construction site Figures, 1952c (CPA).



Figure 5. Montecatini Church project, 1953: 3D study of the geometry (the author, 2019); Castiglioni static diagram and study model, 1954 (CPA); bending moment diagram of the lower arch by C. Siegel, 1960 (1).

The structural research on the plastic articulation of the church architecture started with the Besozzo and the Viggiù project became a recurring undertaking for Castiglioni (23). In 1953, Castiglioni took part in the Italian national competition for the Montecatini Basilica, which included the project for the construction without cladding of the basilica church. Thus, Castiglioni's intentions addressed to an ecclesiastical body that "had to hold up even without cladding, façades, decorations and colours".

The so-called "architecture of walls and structures" was, indeed, based on the design of a base module - a pair of portals (of 22.5 metres of light and 18.75 metres in height), each consisting in the superposition of two arches with three hinges – that supports a roof frame of arched sheeting, covered by a thin vault. The succession of the seven portals, resting on mighty buttresses, punctuates the single nave towards the altar whilst the sheeting allows the zenithal light to be filtered laterally (Figure 5).

The "dramatic resolution" of the sacred space, in the words of Castiglioni, "must avoid pretence" and is thus substantiated - as the technical notes accompanying the project report - by the concordant functioning of the structure.

Castiglioni's report focused on the portal that, with two orders of arches, presented as a structural solution able to simultaneously solve the problem of the static determination of the system and, in an entirely unique way, that of containing the horizontal thrust of the vault (traditionally resolved by inserting a tie-rod). Analysing Castiglioni's words to explain the functioning of the portal clarifies how, through the study of the system's geometry and particularly the original grafting between the arches, the counter-thrusts of the upper arch decrease the horizontal thrust of the entire system, favouring the stability of the pillars.

The coincidence between form and structure, on which the architectural theme of the church is centred, is further described in the plan drafted by Siegel (18): the diagram of the bending moment of the lower arch, generated by its dead load and from the load system of the load-bearing structure (the upper arch and roof), seems to retrace its profile (Figure 5).

These expressive needs of the worship building were entirely manifested in 1953 with the Basilica project (Figure 6).

An explicit reference to historical structural elements substantiates the 1953 "Basilica project", evoking a Gothic reminiscence in the combination of a ribbed skeleton and a system of vaults. The basilica has a three-nave structure, with the central nave reaching 21 metres in height and being covered by a succession of five vaults (with a square layout) whilst the two lateral naves are closed by a pitched covering consisting of a series of conoidal vaults.

The composition of the structure is entirely modular. The generative element is constituted by the coupling of a tripod, hinged to the ground, with a conoidal vault with an equilateral triangular layout.

Six tripods per side, surmounted by their respective vault, delimit the central nave and are joined together by five internal vaults that - being identical to the first - converge in the opposite direction, forming a folded surface. Each tripod has two arms on the same plane, connected by a series of arched elements at the top. These curvilinear elements consist of straight sections forming the triangular weaving of the exoskeleton of the lateral naves. Completely extradited from the vaulted system, the exoskeleton converges on five perimetral pillars on each side that contemporaneously constitute the third support of the isosceles conoidal vaults, following the spatial layout of the vaults resting on the tripods.

The five central vaults were imagined as being completely "perforated". This geometry is thus transposed into the design of alveolar surfaces in reinforced concrete, the subject of a detailed construction study reported in the project drawings. A series of drawings illustrates how, by casting concrete in special formworks obtained by placing hexagonal brick elements.



Figure 6. Basilica project, 1953: study model and section drawing, 1953 (CPA).



Figure 7. Busto Arsizio primary school in Sempione district, 1955-1958: view and drawing of the main façade (CPA); Gorla Minore primary school in Parco Durini,1956-1959: external view and crowning detail drawing (Gorla Minore Archive).

#### 5. "STRUCTURAL DECORATIONS" (1955-60)

In 1953, Castiglioni was commissioned to design the *Casa della Cultura Cattolica* in Busto Arsizio. The small, two-story building is characterized by a mixed frame in reinforced concrete and granite, conceived by Castiglioni and calculated by the engineer Alberto Cugini.

The structure, although of 'orthodox conception', has a continuous overhang on the road-facing front of the building, supported at the ends by two sturdy brackets and, in the intermediate areas, by two sturdy granite pillars, the first monolithic and the second, made of reinforced concrete, covered with the same Quasso stone. The building was presented even on "Informes de la Construction" in 1958, underlining the reinforced concrete cantilevered structure and the 15-meters metal enclosure, shaped as lattice spatial trellis and suspended between the two pillars (19). The main front of the building, as it was conceived, was described by Giancarlo Ortelli with the term *decorazione-struttura* (structural decoration) (20), to indicate the figurative use of the structural elements.

The concept was strength in the mid-1950, within the project of the load-bearing structures of two primary school buildings built between 1955 and 1959 in Busto Arsizio (21) and Gorla Minore (22).

At the time of the construction sites of the two buildings, indeed, the price of labour was very competitive in the Varese district, even for skilled workers (a carpenter or blacksmith cost 408 lire per hour), which made possible the economical formation of "pillars, beams and any reinforced concrete element of any section and shape", as well as the tailored designs of the iron-profile windows frames.

The first building, designed with the engineer Dante Brigatti (head of the technical office of Busto Arsizio municipality), is, thus, recognizable by the design of two original portals, in the shape of a Greek P, located outside the main classroom façades (Figure 7). These elements are eight meters high and, with a five-meter span, present 3.75 meters of symmetrical overhang supporting a sturdy honeycomb frieze. Designed as double overhanging frames hinged at the base, the portals support the 6.25-meter roof spans of the classrooms. According to the calculation model adopted by Castiglioni - in the in which it was also disregarded the horizontal beam bending moment decrease due to the contribution of the side overhangs - the dimensions of the portals were clearly defined as "architectonic". From a design perspective, indeed, while the dimensional evidence heightens the architectural expressiveness of the portal, its shape evokes its real structural behaviour; under the weight of the sturdy frieze, the stringer of the portal inflects, and the pillars, still imagined as though they were free at the base, consequently open outwards to where the two sturdy plinths absorb the horizontal forces, keeping the system in balance.

A similar decorative function of the structural elements characterizes the primary school project commissioned to Castiglioni by the municipality of Gorla Minore in 1956. The project, to be carried out in the eighteenth-century park of Villa Durini, was subject to the preliminary requirements and approval of the local authorities, including the need to favor the perception of the slope of the park towards the valley, to give the façade "noble decorative elements".

The suggestions, accepted by Castiglioni, were applied in the original concept of the building's structure. Eight large, loadbearing walls, in a comb-like arrangement, formed the elevated structure, while decorative element was designed as a crowning structure. Eight lamellar flower capitals, at the load-bearing walls, partitioned the façade in a large-scale order and became the crowning cornice of the transverse façades and the atrium (Figure 7).

Castiglioni intended that the frieze and capitals would be part of the roofing system, as conceived in a first draft that involved extending the design of the flower capitals into a thin, variously curved ribbed shell that remained unbuilt.

The last Castiglioni built work was the imposing ITIS school building in Castellanza (Figure 8). Designed in 1959 and constructed between 1962 and 1966 with the support of the engineers Carlo Fontana and Oreste Viterbo, the complex is Castiglioni's most impressive (and well-known) work. It consists of two symmetrical buildings that flank the portico; the two buildings have a novel inverted T-section in which the highest central core, split longitudinally by a zenithal fissure, connects to two lateral wings with a curved roof. Thin vaults were combined, in a rigorously modular system, with an imposing reinforced concrete frame characterized by curvilinear elements.

Each half of the building has an independent structure. It is composed of four base modules, each of which is formed by three imposing frames in a comb-like arrangement supporting four reinforced-concrete conical vaults that cover the laboratory spaces on the ground floor and the frames of the building's three classroom floors.

The school was completed in 1966 and, due to its impressive reinforced concrete structure, was soon recognized as an icon of architectural brutalism (18,19), although the original design of the building, significantly modified to accommodate economic constraints in its construction, would probably have inspired a different critical interpretation. Indeed, the

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Figure 8. ITIS school in Castellanza, 1959-1966: external view, study model and structural drawings by the engineer Fontana (CPA); study model of the unbuilt pillar-skylight of the atrium; view of the vaulted roof of the laboratorios at the ground floor (CPA).



Figure 9. Santuario in Syracuse, coloured drawing and plaster study model, 1956 (CPA).

school building was built in two phases between 1962 and 1966, when the labour conditions in the province of Varese had drastically changed. The cheap labour exploited for the primary school buildings of the late 1950s was no more, leading Castiglioni to abandon, during construction, the main 'structural decorations' imagined in the original design. For example, the original pillar-skylight that, consisting of shaped slats on a conoidal volume, would have formed the floral ceiling of the atrium (Figure 8). With a fully examined construction process relying on the use of special plaster formworks, the element would have been built through the off-site construction of the shaped slats, which would have been set in place without any scaffolding. In 1962, this structural element was drastically simplified, to be cast in situ in a novel economic solution; completely renouncing the pillar function of a skylight, the atrium roofing was set on a new series of completely filled conical calyx capitals, while even the coloured marble envelope that would have partially covered the exposed reinforced concrete of the external façades was eliminated in construction.

Since the 1950s, together with the pillar sky-light designed in 1959, most of the Castiglioni structural projects remained unbuilt. Between them, the project proposed at the international competition of the Syracuse Santuario, in 1956, and the small church of Sant'Anna in Busto Arsizio, conceived in 1960.



Figure 10. Sant'Anna Church in Busto Arsizio, plaster study model of the church, 1960 (CPA).



Figure 11. Sport hall project in Busto Arsizio, general view and plan (Busto Arsizio Archive).

The competition for the Syracuse Santuario was a 'fair' of international structuralism. It is in this context that Castiglioni partook in the challenge with such an unusual spatial configuration (Figure 9). According to technical reports of the projects, the choice of the central-plan church was the "natural resolution of a static self-supporting organism" (23).

Bounded by an irregular hexagonal perimeter, the plan contains three massive pillars that - centrally arranged form an equilateral triangle. The organism reveals itself to be entirely modular. A color drawing of the whole complex (Figure 9), originally designed to be entirely covered in majolica, narrates the geometric combination of the various elements, guiding us in reading their structural function, as hypothesized by Castiglioni. The ribs (in purple) constitute a closed system of arches and vaults which, by eliminating each other's horizontal thrusts, serve to absorb and balance the thrusts of the interstitial vaults and of the dome (in orange), thus ideally conveying only vertical loads to the central pillars.

Castiglioni's hypotheses, based on the identification of the static behaviour of a combination of elementary structural elements, "lowered vaults, conical vaults, small arches, each completed and all blended together in an integral organism", in this case, do not permit sizing the thickness of the shells, for which the designer counts on the help of a future physical structural model.

In 1960, the theme of a central-plan church was taken up and carried forward in the project for the church of Sant'Anna in Busto Arsizio.

The plan was bounded around the perimeter by a regular hexagon that contains within an equilateral triangle whose vertices, also, in this case, coincide with the position of three pillars.

For the realization of the net, it was assumed that the 12- centimeter elements of the rhomboid profile were prefabricated - through the use of metal formworks cast on plaster moulds, conceived by the same construction firm A. Locati.

The project, complete with the models for the construction of the formworks, was concluded in 1960. The unexpected delay was due to the time needed to obtain the public subsidy for the construction of the building, which ultimately prevented its realization.

The structure consists of two independent systems. The first, which delimits the evocative liturgical space imagined as a cavea, consists of a canopy-covered by a hexagonal spire, whilst the second - completing the covered area - is formed by three identical shells that, rising from the perimeter of the building, head towards the centre (Figure 10).

The curvilinear geometry is defined with the help of a plaster model created by the craftsmen of the A. Locati company in Busto Arsizio. The forms are obtained through the casting of the plaster in moulds, with a process similar to that which the same company would have used for the cast of the prefabrication of the reinforced concrete elements of the canopy.

Together with the Sant'Anna church, the last structure remained an unbuilt project in Busto Arsirzio: the Sport hall (Figure 11), designed together with Dante Brigatti and Sergio Brusa Pasquè in 1959.

The structure was composed of an inverted dome and a hyperboloid-shaped roof. In detail, a crown of radial walls supported the inverted dome-shaped structure featured by an annular beam, with a Z-shaped profile supporting the roof that, geometrically formed of a hyperboloid, consisted of an open honeycomb-like meshing with a rhomboid weave (of lamellar elements).

# 6. CONCLUSIONS

The history of the construction of Castiglioni's structural project, presented in this article, provides a material narrative that was still overlooked both in engineering history and architectural history of the 1950s and 1960s Italy, disclosing a built local heritage of the Varese province and a heritage of unbuilt structures.

To be discussed, Castiglioni's work is to be framed first in the architectural debate of the 1950s when 'structuralism' (in the meaning of the spatial conception embodied by the loadbearding structure) has been affirmed itself as an international trend (24-26). More in detail, Castiglioni's work has to be placed in the special context of Italy in the 1950s, where an actual 'Italian School of Engineering' (27-28), was been establishing, with its own expressive languages (29-30).

In this cultural framework, Castiglioni's first works (1951-54) bear witness to the first attempts of the structural imagination that, grounding on the use of reinforced concrete, would have been affected modern Italian architecture, in the late 1950s, becoming, with the strong collaboration between architects and engineers, one of its main distinguishing features (31-32). Indeed, in the spring of 1954, when the Naples train station was conceived, the structural experimentation in Italian architecture could be summed up in few 'figures' that were been affirming in the international scene. The international 'journey' of this project through architectural journals announced, in a sense, this late success. Moreover, Castiglioni's work has to be reframed in the selfsufficient development of the provincial territory of Varese in postwar Italy. This territory was directly governed by local engineers and architects, guaranteed him a continuity of work between the early 1950s and the mid-1960s, that allowed him to participate in the long series of national design competitions in which his most affirmed 'structural fantasies' took shape. The peculiar dimension of the building sector in the Varese district allowed Castiglioni to be directly engaged in the construction of buildings for the development of the collective life of small municipalities (churches, sports facilities, and primary schools), while a small number of local construction firms and artisans was involved in the construction sites, shaping a common technical culture. Shared non-ideological use of construction technology was developed on the available skills of local contractors and workers. Thus, in each building many technologies are experimentally overlapped, such as the use brick arches, in-situ reinforced concrete structures with ad hoc designed wooden formworks, prefabricated elements formed with plaster moulds and steel formwork, stressing the craft-driven approach that featured Italian construction culture of the time period (33).

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