Highlight

The study regards 1950s Italian architecture. The focus is the Enel Palace of Cagliari. The general topic is the relationship between structural and architectural design.

Abstract

The various topics of the Italian architectural debate of 1950s reveal themselves on the project of the Enel Palace of Cagliari, designed in 1957 by Gigi Ghò, Milanese engineer and architect. The reinforced concrete structure shows an interesting solution with base-hinged pillars in the shape of a “V”, and strongly influences the facades layout that, like Giò Ponti, the architect considered not a design applied to a construction but an aspect of the very same structure [1]. The façade arrangement, the particular attention on the materials choice for finishes and the obsessive definition of the detail define Gigi Ghò personality.

Keywords

Gigi Ghò, Palazzo Enel, Palazzo SES, Structural engineering, Architectural language, Tall buildings, Brise-soleil, Cagliari

1. INTRODUCTION

The building in Cagliari designed by Ghò represents an interesting contribution to the various topics object of the debate on architecture of the ‘50s – environmental pre-existences, neorealism, International style – and was affected mainly by the privileged relationships that Italian architects nourished with the world of structural engineering in those years. On the one hand, the supporting structure based on V-shaped base-hinged pillars, which according to Curt Siegel’s definition have a “light appearance, which basically better satisfies our modern sensitivity”[2], with on the top a series of double-pitched roofs influenced by the topic of contextualism (but made of thin concrete slabs); on the other hand, a façade device with an overall width of 1.20 metres, consisting of a brise-soleil system, partially mobile and partially fixed, and a glass wall, which on the first and last level develops throughout
its height from floor to floor; finally, the special attention shown in choosing the materials for the finishes and the obsessive definition of detail, which are confronted with the planning practice suggested by Ridolfi’s Manual widely adopted, for example, in the context of Ina-Casa.

2. STRUCTURE AND LANGUAGE

It is 1957 when Gigi Ghò, an engineer and architect from Milan, was appointed to design the Building of the Società Elettrica Sarda [Sardinian Electrical Company] in Cagliari. The idea of this small “skyscraper” inaugurated in 1961 was based on the need to create a functional and flexible office building, which could be enlarged if necessary or whose intended use could be changed, capable at the same time of emerging as an icon of the productivity and innovation of society.

This work however has another mission as well, more linked to the city, as shown by the numerous articles published about its construction on the most important local paper.

A role emphasised by its height and deeply connected to its location near the port, on the background of Via Roma, the city seafront, below the bastions, which once defended the walled city.

![Figure 1. View of the complex from Piazza Amendola, photo by Pierluigi Dessì (foto@confinivisivi.it).](image-url)
In order to build it, the chosen lot of land was cleared of the old buildings and increased in size until it incorporated the area, which had been destined for the tram station, given by the City to the Company under the condition that Ghò would also be in charge of designing this small building.

As the author himself states in his preliminary report, the reasons inspiring the project were the desire to create spaces, which could fully meet the users’ needs, the development of environmental strategies and techniques aimed at guaranteeing the utmost comfort, the research of a reassuring close continuity between the architectural environment and the landscape and finally the clients’ propaganda goals. Two solutions were initially devised: a composition made of two high volumes forming a “dynamic” picture, for a greater freedom of partial perspectives; a more “static” composition due to the basic juxtaposition of a high volume overlooking Piazza Deffenu and a lower L-shaped one on the south side of Piazza Amendola and along a secondary street included in the Reconstruction Plan of the time. Although Ghò preferred the former solution, the choice fell on the latter, since an accurate study of the prospects revealed that the shape of the building seen from the bastions did not interrupt the line of the horizon, as required by the panoramic restrictions imposed by the Superintendency for areas of great public interest.

A C-shaped building was then born, overlooking a courtyard at the back and the city with three very different volumes: the thirteen-floor tower on Piazza Deffenu, the central block facing Piazza Amendola and the volume on the secondary road, both with five storeys. To the south the tower adheres to the old Palazzo Tirso built in 1926 and is served by an independent entrance used by visitors, managers of the offices that were on floors 1 to 5 and the users of the houses and offices located on floors 6 to 13, which were rented out. The clients, in fact, imposed for the higher storeys a flexible distribution capable of adapting to the changing needs of an expanding Company. That explains why this part of the building was equipped with a staircase and double lift independent from the other volumes, and at the same time the systems for the residential spaces were separated from the ones for the offices. On the courtyard in the back there are three more accesses, one dedicated to the volume on the secondary road only for the offices, the ramp leading to the basement where the various systems are located, and the service entrance to the central block.

The short winding staircase on the façade facing Piazza Amendola provides instead access to the large central “public hall”, which is closed in the background by two partition walls and lengthways by the customer service counters. This level also houses the representative offices, the data-processing “grattacielo” inaugurated in 1961 si fondava sulla necessità di realizzare un palazzo per uffici funzionale e flessibile, disponibile a eventuali ampliamenti o cambi di destinazione d’uso e capace al contempo di configurarsi come un’icona della produttività e dell’innovazione della società. Ma quest’opera ha anche un’altra vocazione, più legata alla città, come testimoniano i numerosi articoli pubblicati sulla sua edificazione nel giornale locale più importante. Un ruolo enfatizzato dalla sua altezza e strettamente connesso alla sua collocazione vicino al porto, sullo sfondo della via Roma, il lungomare della città, a valle dei bastioni che un tempo difendevano la città murata. Per permettere la sua edificazione, il lotto scelto fu sgombrato dai vecchi fabbricati e ampliato fino ad inglobare l’area destinata alla costruzione della stazione delle tramvie ceduta dal Comune alla società a condizione che Ghò si sarebbe occupato anche del progetto di questo piccolo fabbricato. Come l’autore stesso precisa nella relazione preliminare, i motivi ispiratori del progetto furono il desiderio di creare spazi pienamente rispondenti alle esigenze degli utenti, l’elaborazione di strategie ambientali e tecniche volte a garantire il maggior comfort possibile, la ricerca di un ruscellante rapporto di continuità tra ambiente architettonico e paesaggio ed infine le finalità propagandistiche della committenza. Inizialmente furono elaborate due soluzioni: una composizione di due volumi alti formanti un quadro «dinamico» per una maggiore libertà di prospettive parziali; una composizione più «statica» dovuta all’elementare accostamento di un volume alto su Piazza Deffenu e uno più basso che si sviluppa a L e si allinea sul fronte sud di Piazza Amendola e lungo una strada secondaria all’epoca prevista dal Piano di Ricostruzione. Benché Ghò preferisse la prima soluzione, la scelta ricadde su quest’ultima constato poiché l’accurato studio delle visuali richiesto dal vincolo panoramico imposto dalla Soprintendenza per le aree di notevole interesse pubblico. Nasce così un edificio con un impianto a C che si affaccia su una corte retrostante e sulla città con tre volumi molto differenti: la torre di tradizioni piani su Piazza Deffenu, il blocco centrale rivolto su Piazza Amendola e il volume allineato lungo la via secondaria, entrambi di cinque piani. La torre aderisce a sud al vecchio Palazzo Tirso eretto nel 1926 ed è servita da un ingresso indipendente destinato ai visitatori, ai dirigenti degli uffici che occupavano i piani compresi dal 1° al 5° e agli utenti di abitazioni e uffici ceduti in affitto dal 6° al 13°. La committenza impose infatti per i piani superiori una distribuzione flessibile capace di assecondare le mutate esigenze di una società in espansione. Si spiega così la scelta di attrezzare questa parte dell’edificio con corpo scalo, doppio ascensore indipendente dagli altri volumi e al contempo distinguere gli impianti per le abitazioni da quelli per gli uffici. Sulla corte retrostante ci sono altri tre accessi, quello dedicato al volume sulla via secondaria interamente dedicato agli uffici degli impiegati, la rampa che introduce...
centre, the accounting departments, a shop and the porter’s house. A complex organisation where, on all scales, each element refers to the following one, creating a continuous sequence of spatial and functional relationships. From the lobby the higher floors can be reached via a helical staircase enclosed by a glass brick wall made of diffusers of the Planilux 20x20 type, drowned in

Figure 2. Plan of the first floor, (© Archivio Gigi Gho - All rights reserved).
reinforced concrete. On the different floors, a central corridor allows access to the many offices overlooking the courtyard or the city. The only exceptions are the third and fourth floor of the central building, dedicated to the double height of the boardroom, which differs from the other rooms also because of its walls covered in shiny, glossy teak panels and its coffered ceiling with polished teak slabs and smooth opal perspex panels held up by wooden frames and illuminated above.

The project was approved on 7th August, 1957, by the City’s building commission and soon after that by the Superintendency as well. After a call for tenders the diagnostic study of the lot of land and the foundation works, tested on 6th September, 1958, by Angelo Berio, professor at the Department of Structures of the University of Cagliari, were assigned to ICOS, a company from Milan. Since the resistant rocky layer was at a depth varying between a minimum of 10 metres and a maximum of 20 metres, traditional machines and scaffolding were used to pour in place 260 drilled piles connected to the reinforced concrete structural cage above by means of large plinths capable of grouping up to 9-12 units. The construction of the structures above ground was assigned to the Società Italiana per CondotteAcqua (Italian Company for Water Pipes), winner of the call for tenders, to which also important companies such as Ferrobeton, Cogego, SO.GE.NE and IRCopaticipated. The direction of the construction site was given to the engineer Flaminio Della Chiesa (AdalbertoLibera’s brother-in-law) who started work on 5th September, 1958, and ended it in December 1960.

Upon Ghò’s request, the project of the bearing structure, consisting in a structural framework made of a 1.20 metre module, was commissioned to the engineer Gaetano Angilella who had gained significant experience in building residential complexes and important public buildings and that in those years was cooperating with Ghò on the project of the Co-Fa offices in Milan. A clause in the contract assigned however the entire responsibility of the executive project of the calculation in reinforced concrete to the construction company, which immediately accused Angilella of having conceived an inadequate structure for the tower body in terms of the true bearing capacity of the pilework already carried out. In order to resolve the controversy, which blocked the site for just over a month, in 1958 the commissioning body designated Berio also for the supervision of the structural project. In his final report, he stated that the “skyscraper” showed such a complexity that it was not possible to adopt for all the restraints the simple schematisation of the perfect fixed support. The casting of the structural elements was in fact carried out in several steps, both between the main elements and between these and the secondary ones.
This aspect made it easier for partial micro-cracks to appear in the stretched areas, not visible from the outside and in any case not assessable. Neither was it possible to guarantee the stiffness of the footing restraints, at the insertion with the foundations, or calculate the local variations of the elastic constants of the castings, also because of a possible but not assessable collaboration between structural elements and the surface coatings. As a consequence, the calculation method chosen by the company and based on the hypothesis of perfect elasticity, monolithicity, uniformity and isotropy was not necessarily better than Angilella’s, who instead used simpler, but not less rigorous, schematizations [3]. Berio thus believed that the foundation structure was capable of supporting the building as it had been conceived while designing it, refused the company’s proposal to ease the load on the foundation structures by using prefabricated floors, because this solution could not guarantee the same monolithicity and rigidity of concrete and masonry flooring systems and the reduction in weight, using concrete slabs of the same thickness, would have been irrelevant. “Perfetto”-type floors were therefore created, using a double rib with a three-centimetre concrete topping. The relationship of trust between the company and Angilella was however compromised, hence the structural calculations for the other volumes were completed by the engineer E. Giannini, appointed by the company.

The skeleton structure does not show any significant boldness, but deeply influenced the layout of the façades; based on “V-shaped” base-hinged pillars, it marks the layout freeing the corners from vertical supports and ends on the top with a sequence of double-pitched roofs. As specified in a letter by Ghò himself, in order to give vigour to the building on the façade overlooking Piazza Deffenu, the pillars were moved outside, anchored to the five “fork-shaped pillars”, with a reduction in the thickness of the pilastrade, starting from 40 cm from the first floor and losing 2 cm of thickness at each floor uniformly, so that at the 12th and 13th they have a thickness of 18 centimetres, emphasising the transparency of the building. The coverings are conceived as a thin “sheet-like” structure in reinforced concrete created on site, detached from the rest of the building so as to clearly show they are supported. It is an origami, the result of a serried series of eight-centimetre double-pitched roofs, which compensate for the absence of the gable with their resistance due to their shape and the presence of a large central beam supporting the top of the roof, which is supported by four spine pillars. The pitches with a smaller span, which offer greater resistance to vertical stress, were placed at the ends, to close the composition; the acting forces concentrated on the “factitious” supports are in fact proportional to the length and the inclination per tutti i vincoli di grado elevato la semplice schematizzazione del perfetto incastro. I getti degli elementi strutturali venivano infatti eseguiti a più riprese sia tra le membrature principali che tra queste ultime e le secondarie. E questo aspetto facilitava la formazione nelle zone tese di parziali microfessurazioni non visibili dall’esterno e comunque non valutabili. N’è d’altra parte era possibile garantire la rigidità dei vincoli ad altezza, in corrispondenza dell’innesto con le fondazioni o calcolare le locali variazioni delle costanti elastiche dei getti anche a causa delle possibili ma non valutabili collaborazioni tra elementi strutturali e rivestimenti. Di calcolo scelto dall’impresa e basato sull’ipotesi di elasticità perfetta, monoliticità, omogeneità e isotropia non era necessariamente migliore di quello svolto da Angilella che si avvalse invece di schematizzazioni più semplici ma non per questo meno rigorose [3]. Berio ritenne quindi la struttura di fondazione in grado di sostenere l’edificio così come era stato concepito in sede di progetto e rifiutò la proposta dell’impresa di sgavellare le strutture di fondazione utilizzando solai prefabbricati, sia perché la soluzione non sarebbe stata in grado di garantire la stessa monoliticità e la rigidità dei solai laterocementizi, sia perché la riduzione del peso, a partita di spessore della soletta armata, sarebbe stata irrilevante. Furono quindi realizzati solai tipo “Perfetto”, a doppia nervatura con una caldana di 3cm. Il rapporto di fucidizia tra le società e angilella era però ormai compromesso e così i calcoli strutturali degli altri volumi furono portati a termine dall’ing. E. Giannini, incaricato dall’impresa. La struttura a scheletro non presenta arrotondate particolari, ma ha inciso profondamente sull’impaginazione delle facciate; basata sui “pilastri a V” incernierati alla base, scandisce l’impagliamento libaramente da sostegni verticali e si conclude in sommità con tetto a falde a rimo alternato. Come lo stesso Ghò precisò in una lettera, per dare slancio all’edificio nel prospetto su Piazza Deffenu i pilastri furono portati fuori, ancorati ai cinque “fattori a forcella”, con una riduzione degli spessori delle pilastrade che partono da 40 cm dal primo piano e perdono 2cm di spessore ad ogni piano in modo uniforme, sicché al 12° ed al 13° hanno uno spessore di 18 cm accentuando così la trasparenza dell’edificio. Le coperture sono concepite con una sottile struttura “in foglio” in cemento armato realizzata in opera staccata dal resto dell’edificio affinché esprima con chiarezza il fatto di essere sorrette. Si tratta di un origami composto dalla successione serrata di tetti a due falde di 8 cm di spessore che suppliscono all’assenza del timpano con la loro resistenza per forma e con la presenza di un travone centrale portante il colmo del tetto, che poggia sui quattro pilastri di spina. Le falde di luce minore, che presentano una maggiore resistenza agli sforzi orizzontali, furono disposte alle estremità a chiusura della composizione; le forze agenti concentrate sugli appoggi “fittizi” sono infatti proporzionali alla lunghezza ed all’inclinazione.
of the sheets themselves. A five-centimetre insulating layer in vermiculite and a sheet of aluminium on a layer of felt protect the extrados of the covering, while the slightly lemon-coloured shade prescribed by the author for the intrados emphasises the playful dimension of this element produced by the malleability of reinforced concrete, capable of taking any shape and creating light objects, which seem ready to soar into the air, despite their materiality. Ghò in fact considered colour “an integrating part of architecture”, used in harmony to accentuate some effects, in contrast to strengthen moments in themselves or pauses or to highlight voids or full spaces.”

An approach that affects the entire building. The pillars on the façade and the brise-soleil were in a dull grey, while the lower pane wall was covered on the outside in small 2x2 “green with blue reflections” tesserae to emphasise
depth in perspective, the separation from the old building of the Società ElettricaSarda took on consistent green-black colours or an aluminium texture with stringcourses made of granite from La Maddalena, the area on the ground floor in blue Sardinian ceramic with grey in the background and reflections of various colours. A certain mannerism of the structure emerges, as well as the research of balance between the will to express the tectonic solidity of the reinforced concrete bearing structure, malleable and monolithic at once, and the use of coating materials for expressive purposes aimed at adding further figurative and symbolic meanings to the architectural figure. Most of all, new similarities return between the author and Ponti, who in an article on the Marmont House published on Domus [1] wrote: “the façade of a building is not a drawing superimposed on a construction, but is instead an aspect of its structure itself”.

On the other façades, the presence of the reinforced concrete skeleton does not represent in terms of composition an independent system, but is integrated into the outside walls or glass surfaces. A dialectic that on the façade overlooking Piazza Amendola gives life to three different episodes. On the head of the tower the lightness and the shadows from the portico, which turns round providing a corner solution create a counterpoint to the continuity of the concrete wall entirely covered in small blue marble-chip tiles and supported by two partitions at its ends. Then there is the glass surface of the central body, where the reinforced concrete covered in white cement gives life to a saerried sequence of tall and thin pilaster strips which emphasise the verticality and at the same time support and conceal the aluminium alloy frame of the fixtures, thus erasing the hierarchy between supporting element and finishing element. A concrete railing closes this part of the façade at the top and casts a large shadow on the continuous glass wall of the attic floor, which stands back, bringing the façade line to realign itself with the pillars that actually support the floors. In the third episode, which composes and closes the façade on Piazza Amendola, the frame takes another step backwards, drowning inside the wall and returning a «dynamic» whole marked by sudden projecting parts and indentations, with a game recalling Pozzi’s House in Via Dezza. A theme which Gho also repeats on the longitudinal side of this volume, the only one facing a road instead of the open space of a square, the only one called to closely interface with the urban fabric of the pre-existences. The system of porticoes thus acquires a more traditional cadence. Confined by the full wall it emerges as one large void marked by the slabs of the floors and the thin pilaster strips detached from the inside wall and arranged with a staggered rhythm on the different storeys, emphasising their non structural function.
Figure 4. View of the façade on Piazza Deffenu (© Archivio Gigi Gho - All rights reserved).
The importance given by Ghò to the coating and the expressive abilities of the materials is especially clear in the hall for the public, which Ghò considered the core of the project. Ghò in fact answered the need to create a space which was “architecturally in order” on an irregular area by giving it an independent shape, which entrusts the spatial integration with the higher parts of the building to the study of the perspective plans, highlighted by the finishes, the wall coatings and the light, perceived as parts of the building process rather than additional elements. The precision of the details and materials expresses the idea of a technological evolution of construction, which moves towards mechanisation, starting however from within the traditional structure of the sector. And this evolution takes place not at the construction site but at the plant where the building elements are produced. In this respect, the relationship that Ghò has with the producing companies is significant. For the coatings he basically turned to Ceramica LigureVaccari and Ditta Montecatini, which in the end was given the job. On the basis of the executive drawings elaborated by Ghò himself, the company would arrange the preparation ones and their relevant assembly, and by means of motorsailers it would send the materials to the site, along with a specialised worker and the machinery for installation. Ghò’s attention, but mainly his deep knowledge of the finishing materials also emerges from the precision used in indicating to the Società Marmi e Graniti uno spazio “architettonicamente in ordine” su un’area irregolare, Ghò rispose infatti conferendo a questo ambiente una forma indipendente che affida l’integrazione spaziale con le parti alte dell’edificio allo studio dei piani prospettici, accentuati dalle finiture, dai rivestimenti delle pareti e dalla luce, intesi come materie del costruire piuttosto che come elementi aggiuntivi. Nella precisione della fattura dei dettagli e dei materiali si esprime l’idea di un’evoluzione tecnologica dell’edilizia che procede verso la meccanizzazione, ma partendo dall’interno della struttura tradizionale del settore. E il luogo in cui si svolge tale evoluzione non è il cantiere ma lo stabilimento di produzione degli elementi costruttivi. A tal proposito è rilevante il rapporto che Ghò stabilisce con le imprese produttrici. Per i rivestimenti si rivolse essenzialmente alla Ceramica Ligure Vaccari e alla Ditta Montecatini a cui fu infine affidato l’incarico. Sulla base dei disegni esecutivi da lui stesso elaborati la ditta predisponeva quelli di preparazione e relativo montaggio e tramite motovelieri inviava in cantiere i materiali e un operai specializzato provvisto di macchinari per la posa in opera. La cura ma soprattutto la profonda conoscenza dei materiali di finitura di Ghò emerge anche dalla precisione con cui indica alla Società Marmi e Graniti, che faceva parte della Ditta Montecatini, le cave da cui estrarre ciascun materiale. In un primo momento per il pavimento del salone fu proposto un grès porfirico ma data la necessità di abbattere i costi, Ghò propose di utilizzare “un solidissimo...
Marble and Granite Company], which was part of the DittaMontecatini, the quarries for each material. Initially a porfiric stoneware was suggested for the flooring of the hall, but considering the need to reduce the costs, Ghò suggested “a very solid red granite”.

Figure 6. Brochure and section of the façade on Piazza Deffenu (© Archivio Gigi Ghò - All rights reserved).
The possibility to use a red Collemandina marble was also considered, for the beauty of its colour and its cheapness, but its excessive fragility and tendency to lose shininess convinced Ghò to use this material only in the boardroom, which could not be directly accessed by the public. For the vertical walls he chose instead a “first-quality streaked statuary”, while for the stairs accessing the hall and the lobby on Piazza Deffenu his choice fell on red imperial granite. The coating of the partition walls was not conceived as a weave of sheets, but as a solid and compact plating, a sort of plaster. That explains Ghò’s rigidity, as he had the coating of one of the hall partition walls removed since the slabs did not have the streaks and shades he required. The decision to coat the partition walls in the hall with marble - and initially also the entire concrete wall of the façade, idea then abandoned due to cost issues – was in the first place an answer to the need to increase the level of monumentality of the building. A classical approach, which did not prevent him from coating the concrete pillars of the hall with modular bands in a very modern anticorodal. A solution that easily fits into the “Grecolux” ceiling, bright and partly sound-absorbent, produced by Americana Marlux. It was a totally prefabricated ceiling, installed with great easiness and lightness, which had the advantage of being compatible with the air conditioning and lighting systems. Every element inside was therefore designed and studied with a passion for detail and the creation of space that coincide with the building passion.

3. CONCLUSIONS

The research summarised here is a contribution to the debate on the relationship between architectural design and ways of building, in this case between the worlds of structural engineering and architecture, in Italy in the ‘50s. Banham, who in 1960 wrote about the “overwhelming desire to incorporate engineering forms into architectural designs to the point that engineers enjoy a status both as collaborators with architects and as creators of incomparable forms, which they have never had before” [4], did not understand the peculiar condition of post-war Italian architecture: forced to forget rationalism and also monumentalism, both too deeply connected with the Fascist regime, and committed to the research of languages of the past and the future of building technologies, its present.

4. REFERENCES

[3] The reports of Berio, whose results are summarized here, are taken from the correspondence kept in the archive “Angelo Omodeo”, Cartella M, Cagliari.


