Construction Standardisation in Italian Service Stations (1930s-1950s) Projects by Luigi Piccinato and Mario Bacciocchi

Laura Greco
Department of Civil Engineering, University of Calabria, Cosenza, Italy

Introduction

In Italy in the 1960s, after the succession of modernist advancements and conservation actions, which distinguished the evolution of both techniques and the national building manufacturing sector, building industrialisation spread. These developments began in the 1930s, when – in the wake of European experiments – theoretical studies and design research, which engaged intellectuals, designers and industries, advanced. In this decade between the two world wars, metal construction and production of components for walls aimed at spreading assembly production methods, based on the principles and techniques of building industrialisation. The cultural promotion campaign conducted on Casabella by Giuseppe Pagano, the prototypes presented at the V Triennale of Milan in 1933, the development of samples of prefabricated and demountable houses and offices destined for the market of the Italian colonies in East Africa, and the handbooks published in those years, determined a favourable mood for the advancement of the Italian construction framework [1]. These events and circumstances paved the way for the development of an approach to the standardisation of architectural and construction elements, and for the dissemination of knowledge useful for construction process industrialisation. The Second World War (WWII) imposed a pause. New advancements in the long path of industrialisation marked the years of post-war reconstruction and the subsequent economic boom, due to the demand for buildings and spaces for offices, industry and services connected to the motorway network and the increase of the manufacturing sector. At the same time, the long dominance of masonry construction and the spread of reinforced concrete cast on site restrained the development of prefabrication and building industrialisation in the country. The low progress of mechanisation of the sector was a predominant feature of the national framework in the 1950s, as evidenced by the Ina-Casa public housing program, developed throughout the country.

From 1930-1960, the progression of building industrialisation was supported by research conducted by designers and companies and applied to some building types that proved to be suitable for the confirmation of experiments. These were buildings with original typological characteristics and essential functions, but – at the same time – they played a symbolic value in the definition of modern iconography representating the social transformations of the country. Motorway assistance buildings, such as kiosks and service stations, were a privileged field of this experimentation. The repertoires of standardised service stations designed by Luigi Piccinato in 1938-39 for Petrolea-Fiat and by Mario Bacciocchi in 1952 for Agip, are two examples of research in two key decades (1930s and 1950s). They highlight both similarities and divergences between the two periods and contribute to knowledge on relationships between the experimentation of the 1930s and the developments of the 1950s in the field of building industrialisation.

Service Stations and Construction Standardisation in Italy. Design Aspirations and Building Practice

The design and construction of service stations in Italy took shape starting from the first urban constructions, to extend in the mid-1920s to extra-urban roads, with the development of motorway segments in northern Italy (Lombardia and Veneto in particular). In the 1930s, service stations matured to have more specific characters and functional layout, distinguishing themselves for aesthetical and construction innovation of the buildings.

Inspired by the features of modern architecture, they used reinforced concrete canopies with aerodynamic shapes and glazing panels with thin metal frames [2].

They stood out as unique projects, despite the small size of the buildings, which were highly visible especially in urban areas, as testified by the projects for the service stations on the Venice-Padua motorway (1933), the buildings of Mario Cereghini in Lecco (1937), the Barnabone garage by Giovanni Muzio in Lodi (1933), and the station in Turin by Carlo Agular (1938).

The standardised kiosks for the sale of fuel represented a second and more essential topic of this typological sector. They were built using proto-industrialisation techniques. The kiosks were small boxes for the seller and the storage of products for vehicle assistance, equipped with systems for fuel distribution. They were mainly intended for urban streets and were integrated in the street landscape with increasingly visible and recognisable advertising elements. The kiosks, more than the service stations, participated in 1930s Italian experiments on metal constructions that affected mainly residences and facilities building, thanks to the work of the leading brands of Agip, Siap, Nafta, Aquila, Petrolea, Apir [3].

The repertoire of Luigi Piccinato (1899-1983) was part of this experience, including standard solutions for fuel distribution columns, kiosks, and service stations [4]. The techniques selected by Piccinato for metal construction applied to aesthetical configurations in some cases related to traditional and neoclassical languages. More frequently, this technique adopted innovative options, with modular and expandable layouts.

The Società Anonima Petrolea was founded in Milan on 23 September 1927 by the Russian Nepthesyndacat to trade its products in Italy [5]. In 1935 the S.A. Petrolea was purchased by Fiat (*Fabbrica Italiana Automobili Torino*), the factory founded in Turin in 1899 and leading brand in the Italian automotive industry. By means of the *Servizio Costruzioni e Impianti* (the company's technical department), Fiat promoted the construction of kiosks for the sale of its own oil products and the repair of motor vehicles [6]. Petrolea-Fiat engaged Luigi Piccinato to develop a fuel distribution network able to compete with the leading brands in Italy (Agip and NAFTA in particular). Piccinato's repertoire was based on the combination of four elements: the kiosk, the canopy, the advertising shaft, and the fuel pump. In the international context, these represented the characters of the increasing iconography of service stations. This process of standardisation of functional and architectural elements corresponded to the preference for construction standardisation, based on the use of profiles and metal sheets. The client, designer and builder participated in the definition of Piccinato's typological repertoire and in the production and assembly of components for kiosks and stations. The implementation of this standardisation effort was favoured by Piccinato's collaboration with Fiat and its technical department and, with the company Cos.Met., specialised in metal carpentry and was entrusted with the production of kiosks. The pioneering nature of the Italian manufacturing sector and the resistance of Agip in the 1930s to the spread of the new brand, restrained the construction program of Petrolea-Fiat. In any case, Piccinato's project constituted an important reference for Mario Bacciocchi's work in the 1950s.

In the post-war years, Agip faced a phase of economic difficulty, overcome thanks to the general improvement in the country's conditions. With the appointment of Enrico Mattei in 1946 as vice president of the *Azienda Generale Italiana Petroli* (Agip), the upgrading of the company's building assets began. Mattei created a favourable context. In fact, the development of mass motoring, and the upcoming national infrastructure plan – culminating in the construction of the Autostrada del Sole – stimulated a building program to rationalise the construction costs of kiosks and service stations, to ensure the widespread distribution of assistance points throughout the country and, finally, to define an image of the company in the increasing market of road assistance services.

In 1952, Mattei appointed Mario Bacciocchi (1902-1974) for the development of a catalogue of kiosks and service stations to be spread throughout the country's urban and extra-urban network [7].

In his projects, Bacciocchi expressed modernity through the characters of the three fundamental architectural elements of the service station: the kiosk, the canopy, the advertising shaft [8]. However, he re-elaborated their construction characteristics, making them compatible with the national context of the time, whose technological delay restrained the transfer of the foreign principles of industrialisation to the Italian situation. In fact, Bacciocchi, by selecting masonry structures combined with in situ cast reinforced concrete elements and external cladding in lithoceramics, preferred construction on site, limiting the use of industrialised components.

Evident analogies and decisive divergences, also determined by the different socio-economic contexts of reference, distinguished the two experiences, the analysis of which supports the investigation of these similarities and differences within the Italian construction framework between the 1930s and 1950s.

The Petrolea Repertoire by Luigi Piccinato

As anticipated, Luigi Piccinato's Petrolea-Fiat catalogue contained three basic types of kiosk (small, medium and large) and was marked by the characters of the glazed box, the canopy and of the advertising shaft. The architect produced some variants of each type, to provide dimensional and geometric alternatives. The small kiosk had a rectangular plan (2.15x1.60), with an overhanging canopy that protected the glazed box (Fig. 1). A first variant of this configuration involved the insertion of an advertising shaft for the Petrolea signs and a service space at the side of the box, where the fuel pumps were located. A third option was presented in two drawings dated 6 December 1938, which illustrated the project of the small kiosk with a long side canopy. The scheme (2.15x7.00m) had the glazed box on one end, and the advertising shaft on the opposite side. The entire system was connected by the canopy, below which there were four fuel pumps.

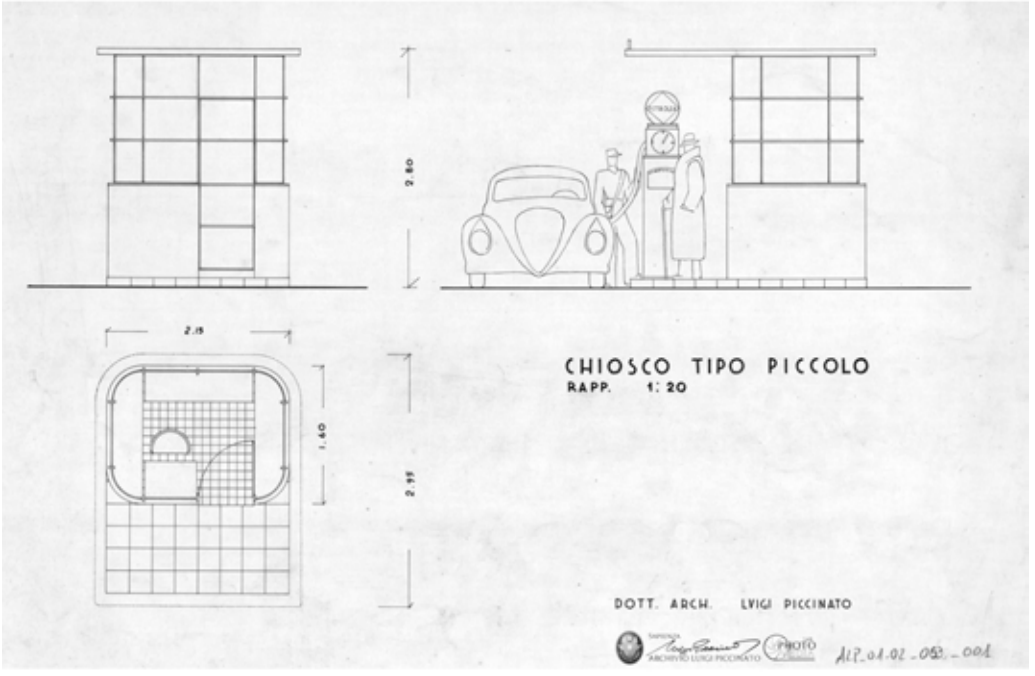

Fig. 1 Petrolea-Fiat small kiosk. Project: Luigi Piccinato, 1938. Source: Archivio Luigi Piccinato, Università di Roma "La Sapienza", Dipartimento di Pianificazione, Design, Tecnologia dell'Architettura (ALP)

The medium kiosk had a similar layout. A first configuration had a short canopy, while some variants had a long lateral roof to protect the fuel pumps (Fig. 2). Also, in this case, the kiosk was located at one end of the layout and, on the other, was the advertising shaft. The medium kiosk with long side canopy was presented at the Milan exhibition in 1939 (Fig. 3). The construction was developed by the company Cos.Met., as documented by the project dated 3 April 1939. The detailed study developed by the company did not modify the functional layout and the architectural features of Piccinato's proposal.

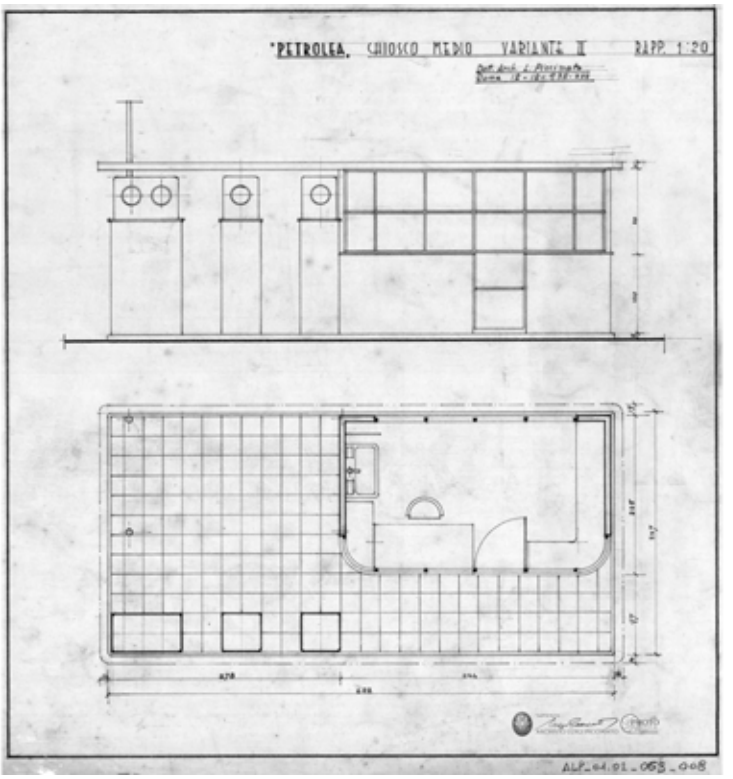

Fig. 2 Petrolea-Fiat medium kiosk with lateral canopy. Project: Luigi Piccinato, 1938. Source: ALP

In general, the design process moved from Piccinato's project, examined and updated by Fiat, and then was developed for production by the company Cos.Met. F. Cassinelli & C. Guercini, specialised in the manufacture of metal carpentry.

Some drawings, executed between April and May 1939, presented the updates advanced by Cos.Met. starting from Piccinato's first drawings and concerning a few dimensional adjustments and some details into the materials and components used. The metal structure consisted of L profiles (60x60 mm) for the uprights; the roof was solved with a framework of NP 50 profiles, metal plates and insulating panels. There was a linoleum floor inside the glazed box, while outside, the area protected by the canopy was paved with stoneware tiles. The innovation of Piccinato's proposal was therefore confirmed by the construction choices that considered the debate on mass construction. In fact, metal construction was promoted in Italy in the cultural and manufacturing debate as a useful option for the implementation of the principles of industrialised construction. On the other hand, materials such as linoleum were analysed and promoted in modern buildings as examples of durability, hygiene and aesthetic versatility.

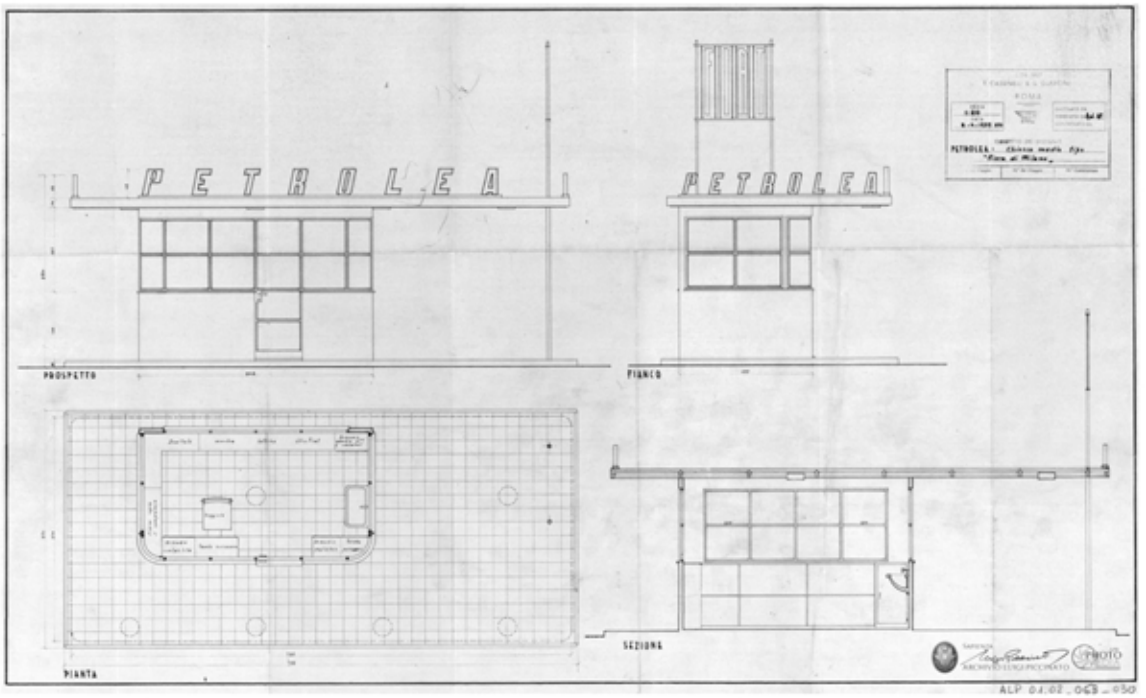

Fig. 3 Petrolea-Fiat medium kiosk at Milan Exhibition, 1937. Source: ALP

From a typological point of view, Piccinato's proposals were influenced by the international context which in the 1930s developed an evident interest in the industrialised production of kiosks and service stations, based on prototypes of the major companies of fuel distribution. In the European context, a reference for Piccinato's work was the Robert Mallet-Stevens station presented at the 1927 Salon d'Automne. Equally decisive for the evolution of the design theme, and useful for the analysis of Piccinato's repertoire, was the experience of the United States, with the types that Norman Bel Geddes developed in 1934 for Socony (later transformed into Mobil), Raymond Loewy's studies for Esso, and those conducted by Walter Dorflin Teague for Texaco [9]. In addition, we consider, the prototypes promoted by companies such as Michel & Pfeffer Iron Works (1926) concerning essential kiosks for urban areas. The echo of this overseas experience affected the Olex production in Germany and, in Italy, the repertoire of Petrolea [10]. A further series of drawings by Piccinato (probably from the early 1940s) concerned the design of a service station (unbuilt) with a reinforced concrete structure, the presence of which was emphasised by the design of the ribs that marked the profile and the intrados of the canopy. Piccinato's approach in these sketches appears more spectacular, with more fluid and aerodynamic shapes, as highlighted by the design of the station and by the profile of the roof slab, whose inclination was studied to define its silhouette. In this case, Piccinato developed a different approach. He studied different station layouts, considering the architectural dimension of the theme. The result was not a prototype of a series, but the definition of more designs of stations; each of them was a unique project. Also, with reference to functional aspects, the buildings were larger and more advanced than the first essential kiosks of 1938-39 and met the needs of a more articulated type of provision to motorists. Referring to the medium-large station, it is noted that the plan was divided into three parts: two service and storage areas were arranged at the ends of the layout; in the centre, a passage protected by the roof slab connected the two supply lanes. The roof, which unified the three functional modules, had a symmetrical profile, with two wings extended over the two supply lanes. In these drawings we can read the influence of European service stations such as the station designed in Madrid by Casto Fernandez-Shaw (1927), the Shell station in Alesund in Norway (1931) and the Aral station by J. Krahn in

Frankfurt, the singular Arne Jacobsen's project in Klamperborg (Denmark) in 1938 and, finally, the BP station in Villejuif in France (1934). However, the most important contribution of Piccinato's work was the repertoire of kiosks. On the one hand, it introduced Agip urban minimal stations of the 1950s based on the use of cold-shaped metal profiles and enamelled sheets. On the other hand, it anticipated some features of the repertoire of Agip service stations designed by Bacciocchi in 1952. The analysis of the Bacciocchi catalogue supports the investigation of these aspects of continuity.

Mario Bacciocchi's Agip Repertoire

In 1952 Erico Mattei commissioned Mario Bacciocchi for the project of a repertoire of shelters, kiosks, filling stations and service stations, which could be placed both in urban and extra-urban areas.

The repertoire, that included 13 types, was based on four fundamental schemes, from which the remaining models derived [11]. The first and most essential was 'Project I', which concerned the canopy provided as either an autonomous element or in support of kiosks and stations (Fig. 4). It was a reinforced concrete slab with a rectilinear profile, set on two supports, its section increasing near the connection with the station roof. The canopy had an asymmetrical geometry: on one side it was set at 3.10 meters high and 1.30 meters long; on the other side it was placed at a height of 2.55 meters and was approximately 1.50 meters deep. The two wings protected the underlying fuel pumps and supported the Agip signs. The system was surmounted by the advertising shaft. The second scheme was 'Project III - Small kiosk without canopy', intended to accommodate the seller in a small cabin equipped with a sink and a desk with chair (Fig. 5). The kiosk combined the box with the canopy which raised about one meter above the 2.50 meter high glass box. Here the echo of the small kiosk of Piccinato is clear. The construction choice was different, given the predominance of reinforced concrete.

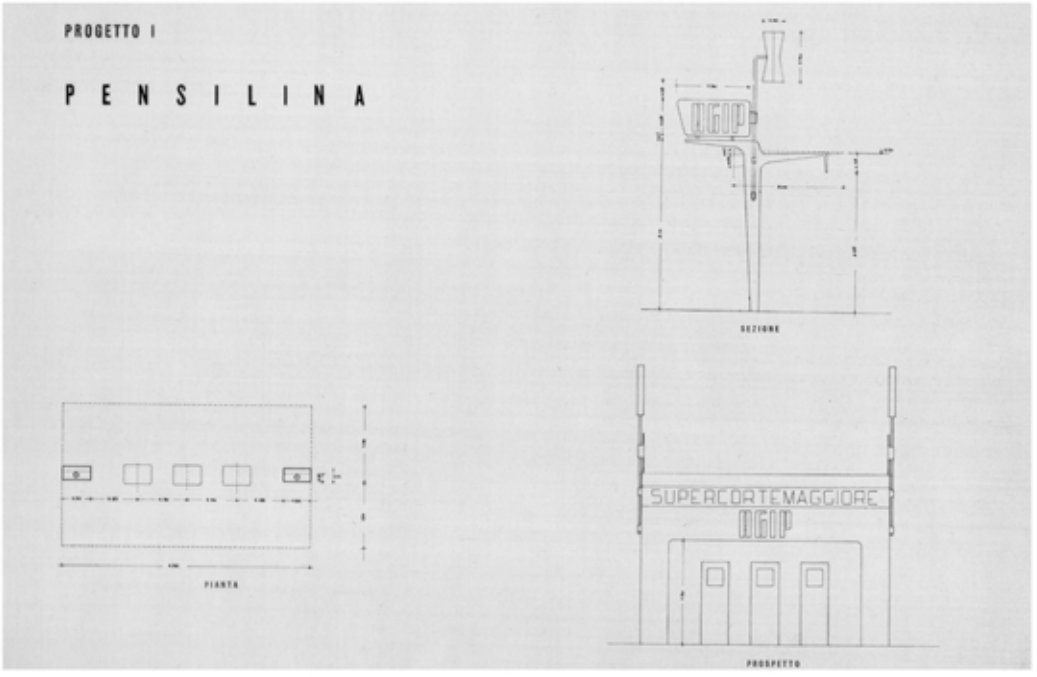

Fig. 4 Canopy of the Agip repertoire (Project I). Project: Mario Bacciocchi, 1952. Source Historical Achive Ente Nazionale Idrocarburi (ENI), Rome (ASE)

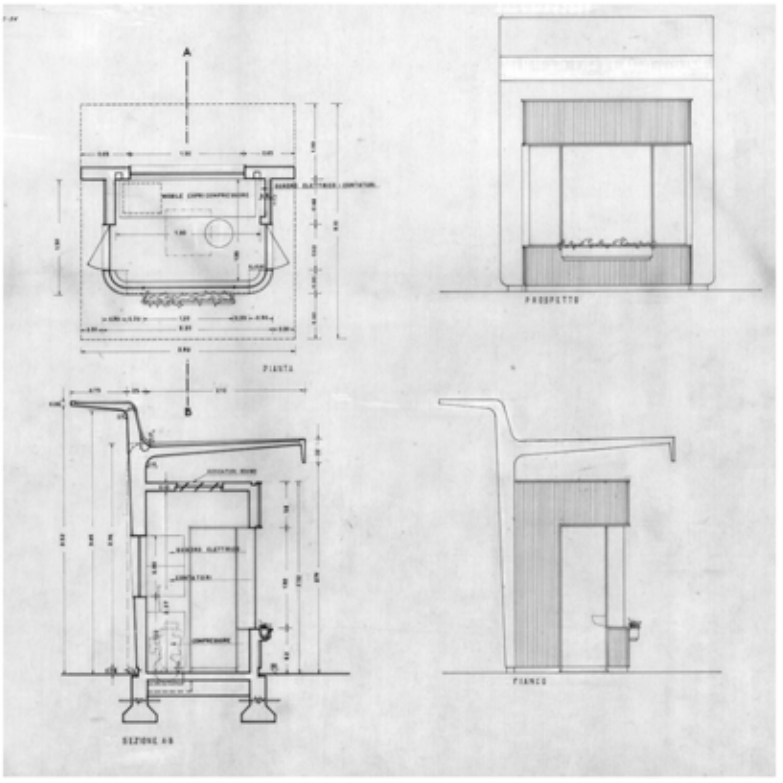

Fig. 5 Small kiosk without canopy of Agip repertoire. Project: Mario Bacciocchi, 1952 Source: ASE

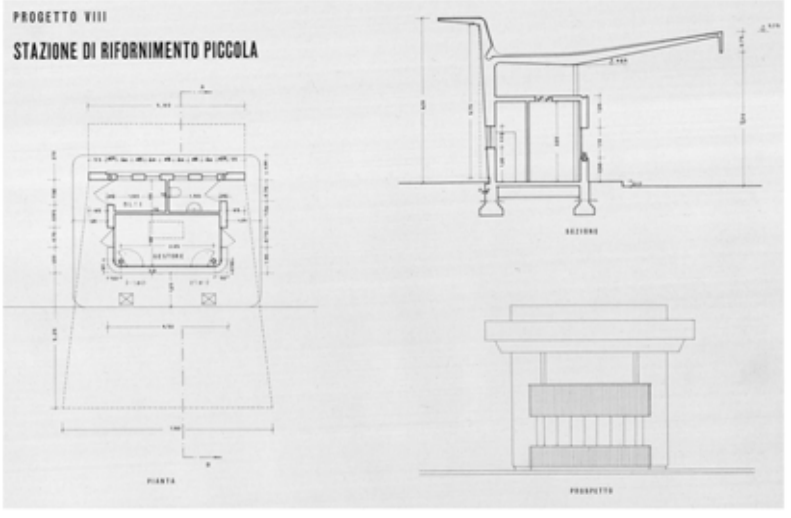

Fig. 6 Small filling station of the Agip repertoire (Project VIII). Project: Mario Bacciocchi, 1952 Source: ASE

The third fundamental scheme of the 1952 repertoire is the 'Project VIII - Small filling station' (Fig. 6). The functional system of the filling station included a sales area, a room for the storage of oils, and customer toilets with access from the outside. The building, about 3.50 meters deep, was divided into two parts, the front one which was more public and reserved for sales and the rear one to accommodate the remaining functions. As in the kiosks of Piccinato, the public part was visible from the outside through the generous windows. Also in this case, as in the kiosk, the aesthetical and construction system of the station consisted of two parts: the box and the canopy. The canopy reached 5 meters in height at the front to allow vehicle access to the protected filling area, and continued up to 6.10 at the back, to complete the usual asymmetrical profile.

The fourth and last fundamental scheme of the repertoire is the 'Project XI - Small service station', organised on a rectangular layout (14.20x6.50). The volume elevated up to 4.95 meters, while the canopy reached a height of 6.20 meters on the front and almost 7 meters on the back. The functional layout, divided into four macro-areas with different surfaces, included a sale zone with rest area and toilet for the manager, a carwash area, a storage area, and an exhibition zone for oils (Fig. 7). In this type, Bacciocchi extended the profile of the canopy to provide protection to the greater number of fuel pumps and to allow the simultaneous movement of several cars. Six cylindrical columns, also arranged symmetrically and with a constant step along the front, marked the construction and aesthetical connection between the canopy and the station box. The profile of the canopy suggested the analogy with the reinforced concrete station presented in Piccinato's sketches of the 1940s, given the similar profile of the concrete canopy. The other schemes of the catalogue derived from the different combination of basic elements (station with or without shelter) and from the size of the configurations (small, medium, large).

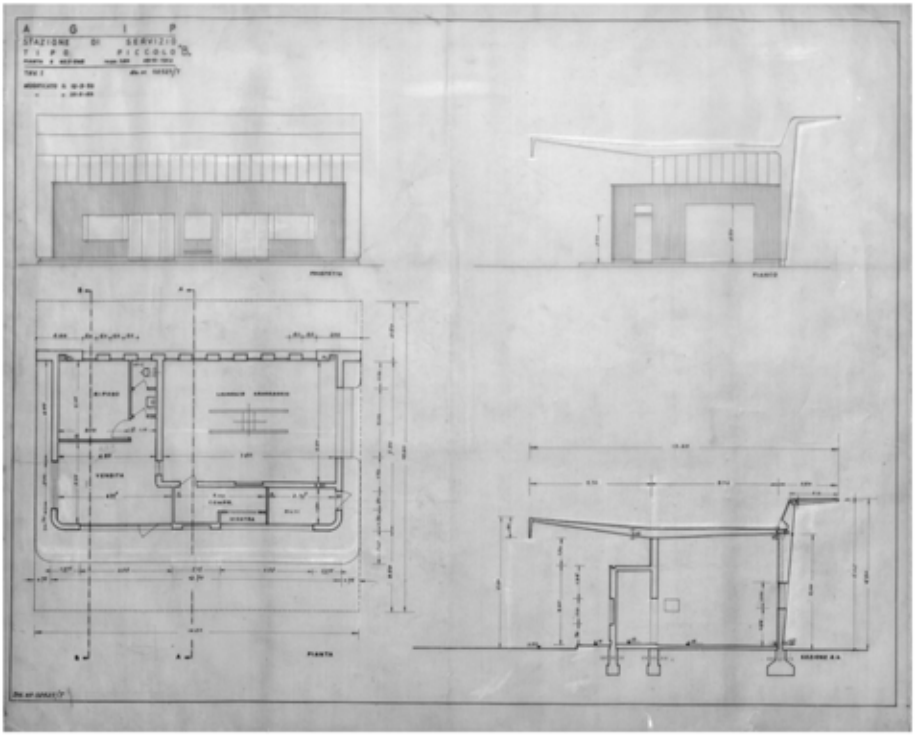

Fig. 7 Small service station of the Agip repertoire (Project XI). Project: Mario Bacciocchi, 1952. Source: ASE

Fig. 8 Service station derived from the Bacciocchi's repertoire built in Barletta (South Italy). Source: ASE

Fig. 9 Small kiosk without canopy of Agip repertoire built in Marostica (Veneto). Source: ASE

Fig. 10 Service station inspired by the Bacciocchi's repertoire and built in Alpine areas. Source: ASE

The selection allowed Bacciocchi to modulate the solutions in relation to as many possible conditions of use and context (Figs. 8-10). It was a paradigm in which the variations of the four matrix projects were defined starting from an original pattern of vehicle assistance functions and the corresponding spatial and construction elements. However, the combination schemes among the parts were pre-established and, in fact, the adjustments over time had transformed the original layout of the Bacciocchi stations, affecting the original features. The functional obsolescence of the earliest schemes was among the factors that, in the mid-1960s, determined the crisis of the 1952 catalogue.

Conclusions

The analysis presented in this study allows us to highlight similarities and divergences between the two repertoires of kiosks and stations. From a methodological point of view, the two experiences show a similar approach of the designers who, aiming at the standardisation of spatial and construction characters of buildings, organised the catalogues starting from few essential patterns from which the further schemes derived. Modular layouts corresponded to this general approach, defined through the combination of spatial elements reserved for specific functions. So, Piccinato and Bacciocchi could vary the functional complexity of the buildings while preserving the basic architectural and construction rules, replicating the layouts in different contexts, defining a recognisable aesthetical and construction system of the kiosks and stations of Petrolea-Fiat and Agip networks.

On the other hand, there is a diversity in the socio-economic and manufacturing context that affected the characterisation of the two repertoires. Piccinato's experience belongs to the events of the 1930s, marked by pioneering experiments and a framework in which the fundamental typological themes of kiosks and service stations took shape. In this period an essential approach prevailed, aimed at ensuring few functions through a basic architectural and construction system, sometimes even using temporary buildings. Bacciocchi's repertoire formed in a period of maturity of motorway architecture, coincided with the formation of the national motorway network and the spread of mass motoring. These assumptions suggested enriching the functions and adopting less essential construction choices. At this stage, the definition of the architectural and construction language was aimed at supporting motorway propaganda towards the Italian middle class with an architectural image able to represent the modernisation of the customs and lifestyles.

Similarly, different construction choices corresponded to this diversity of context. Piccinato's repertoire offered an example, albeit a pioneering one, of real industrialisation of the design and production process of kiosks, with metal construction and prefabrication of the elements. Bacciocchi's repertoire was influenced by the slow evolution of the Italian construction mainstream which, despite the theoretical debate on prefabrication and industrialisation, characterised the period of reconstruction and the 1950s. The preservation of the traditional construction system with few elements of modernity, the preference for construction on site, were choices shared by Bacciocchi's repertoire with the main reconstruction programs developed in Italy in the 1950s.

From these peculiarities derived the different relationships established by the two experiences with the construction framework and with the evolution of the theme of industrialisation in Italy in those years. In Piccinato's repertoire, architectural and construction standardisation was a prerequisite for the industrialisation of the production of kiosks, in compliance with an approach also favoured by the Fiat client, accustomed to mass production and therefore to the development of management models and production processes inspired by criteria of rationalisation of time and resources. In fact, in the 1930s the Servizio Costruzioni e Impianti was a technical structure organised with scientific management standards that pursued the rationalisation of design and construction processes and therefore this spirit affected Piccinato's work.

In Bacciocchi's repertoire, the spatial and construction standardisation of kiosks and stations was aimed at communicative intentions, and therefore at the definition of a recognisable image of Agip throughout the country. Bacciocchi was an architect who worked in his studio with a traditional approach. The Bacciocchi catalogue was the premise on which the technicians of Servizio Costruzioni e Manutenzione di Agip (the company's technical department) developed technical choices, defined the building details, indicated the characteristics of the spaces and of the construction elements in the technical documents. The catalogue was the result of two distinct steps in the design process: first the intuition of the architectural design, then the engineering design developed in terms of rationalisation of techniques and costs [12]. However, the work of Bacciocchi and Agip technicians was aimed at the system of small Italian construction companies, to which it provided a 'manual for construction', useful for ensuring recognisable Agip stations, suitable for the Italian mainstream construction, effective in guaranteeing quality and homogeneous construction standards of stations on the national territory.

Piccinato's repertoire was part of the laboratory on building industrialisation of the 1930s, mainly focused on the use of metal constructions and the relationship between designers and production companies, which was a prelude to the debate on post-war industrialisation. Bacciocchi's repertoire, while not applying real building industrialisation, participated in the debate developed in the post-WWII period on the rationalisation of construction elements to merge construction tradition with the widespread quality requirements of the housing reconstruction programs, of which Agip service stations offered an extensive application in an emerging typological sector both in terms of number and territorial diffusion of achievements.

Ultimately, we can consider the two repertoires as the expressions of the two prevalent approaches to the industrialisation in the Italian framework after WWII: the real industrialisation of the design and construction process through the evolution of all building sector; the standardisation of the architectural and construction elements as premise of a design approach aimed to a more progressive evolution of the construction sector towards the industrialisation.

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